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GADGETS / APPS / GEAR



HTC ONE M9
IT'S A STEP UP



STUFF

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and mobile games tested

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Meet the world's most
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Like a car. But be



Fuel consumption figures mpg (litres/100km) and CO₂ emissions (g/km), Audi A3 Sportback e-tron: Urban: N/A, Extra Urban: N/A, Combined/ two test results: one when the battery is fully charged and the other when the battery is discharged. The two test results are a weighted achieved by 1.4 TFSI petrol engine generating electricity. Standard EU Laboratory Test figures are for comparative purposes between

Audi
Vorsprung durch Technik



What Car? Electric Car of the Year 2015.

The A3 Sportback e-tron is the first of our plug-in hybrid cars. Unlike other hybrids where a lot of effort has been made to make the car look different, e-tron has been designed to make a difference. On the one hand, it can deliver up to 176.6mpg and only emit 37g/km of CO₂. On the other, it will deliver all the performance you'd expect from an Audi. In fact, What Car? have already named it Electric Car of the Year 2015, so the judges seem to agree that the A3 Sportback e-tron is indeed like a car, but better.

The new Audi A3 Sportback e-tron.

etter_



WHATCAR?
**Car of the
Year 2015**
Best electric car

weighted: 176.6 mpg (1.6 litre/100km). CO₂ emissions: 37g/km. The 'Combined/weighted' fuel consumption CO₂ figures calculated from average, taking into account mileage range on battery power only, providing a figure in a variety of charge conditions. Extended range vehicles and may not reflect real driving results. Images for illustration purposes.

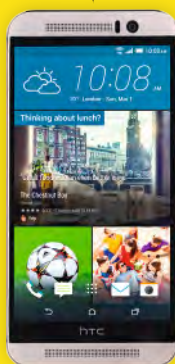
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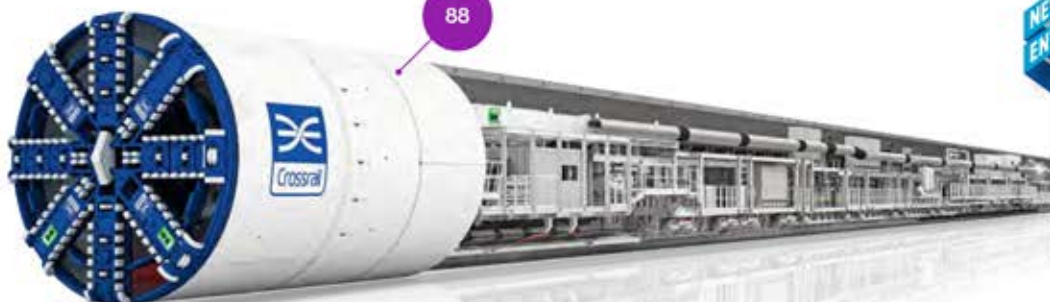
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TOP 10 OF EVERYTHING

Looking to buy something but need a bit of advice? Turn to our *Stuff* Top Tens: our expert listings of all gadgetry, from p121

PHONES



Motorola Moto X
★★★★★
Our favourite Android... for now p122

HI-FI



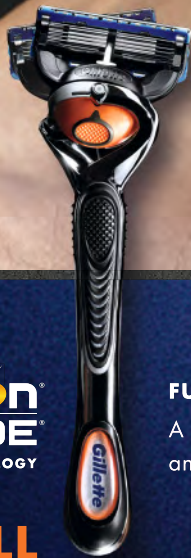
Sonos
★★★★★
Still the best for multiroom music p124

CONSOLES



Sony PS Vita Slim
★★★★☆
It's a Vita alright p131

INTRODUCING A BETTER WAY
TO GET VIRTUALLY EVERY HAIR



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WELCOME



...to a an issue of our magazine for which I've personally ventured underground, twice. The first time, it was to see a dark vision of a possible past, in a Cold War nuclear bunker (see it and other fascinating geek days out on **p112**). The second was to take a look at an altogether brighter and more concrete future, in the giant tunnels of London's new transport system, Crossrail (**p88**).

How embarrassing, then, to emerge and find all my colleagues were not only above ground but staring at the sky, where the swarm of drones that populate this month's cover feature (**p44**) were buzzing, hovering and swooping. If you haven't seen a drone in action yet, you should – it's a scientific-style fact that no other gadget is more likely to cause you to say "let's have a go". It's also worth getting used to them, because they're going to become indispensable: when you're lounging on the 105th-floor terrace of the next generation of skyscraper (pick one on **p67**), who else but a flying robot is going to deliver your 3D-printed microsushi?

Of course, it'll be a year or two before that happens. So, while we wait for sentient buildings and sandwichcopters to arrive, let's take a look at what wonder tech the present has to offer... 

Will Dunn, Editor / wild@stuff.tv / [@willydunn](https://twitter.com/willydunn)



THIS MONTH IN STUFF'S DIGITAL EDITION

- Animated, interactive pages, videos and more hi-res pictures
- Footage of a small dog barking at a quadcopter

Android fan? *Stuff* is also available on **Google Play**, **Zinio**, **Exact Editions** and Samsung's **Papergarden**.



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- 1 ...this great mag landing on your doorstep before it hits the shops, every month.
- 2 ...**Sennheiser CX300-II headphones** (p106).
- 3 ...exclusive reader offers.
- 4 ...also, robots will find you easier to talk to.

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- Volume 19 issue 4
- ISSN: 1364-963
- On sale 5 March 2015
- Audit Bureau of Circulations:
77.340 (Jan-Dec 2013)



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Reproduced by permission of the publisher.
Southern Print; cover printed by Stephens &
Gore; Distributed by Frontline Ltd, Midgate House,
Midgate, Peterborough, PE1 1TN. The US annual
subscription price is \$75.50. Airfreight and mailing
in the USA by agent named below. Second class
USPS registration number 566-155, 146th Avenue, 2nd
Floor, Jamaica, NY 11434. US Periodicals postage
paid at Jamaica, NY 11434. Subscription records are
maintained at Haymarket Media Group, Teddington
Studios, Broom Road, Teddington TW11 9RF.
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H

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HOT
FOUR
#1

DRESSED UP TO THE NINES

HTC One M9

If you're of the jean shorts, sun visor and skates persuasion, then your season is yet to arrive. For smartphone fans, though, spring is the best time of year. We've already seen the curvy LG G Flex 2, we have here the new HTC One and any moment now we're expecting the Samsung Galaxy S6, Sony Xperia Z4, and the Apple iPhone Pro Plus with Digital Wand. OK, that last one is less likely but the HTC One M9 is real, because we've seen it, mucked about with it, and taken this rather fetching photo of it. The new One has a 4.1MP Ultrapixel front-facing camera — all the better for low-light selfies — while the main camera offers 20.7 million standard pixels. There's a 64-bit Snapdragon 810 and 3GB RAM humming away inside, which means you can shoot the breeze about power-efficient LTE multimode transceivers when you're skating the seafront this summer.

As hot as... your denim hot pants

[Etba / htc.com](#)



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F

F

25 PAGES
OF THE BIGGEST
STORIES FROM
PLANET TECH



Hands-on
with the
HTC One M9
**FRASER
MACDONALD**
@herebefraser



There's a Goldilocks element to the design, as if the cute little sneak broke in to HTC's HQ. She finds the One M7. "Too sharp!" she cries, and tries the curvier M8. Drops it. "Too slippery!" she moans, steps over to a drawing board and scribbles out a phone that is curvy on the back, but with an angular front that joins three-quarters of the way up its sides. A year or so later, having served juvey

time for trespassing, she finds her smartphone design has become real.

It's an unexpected twist, but it does combine the best elements of the previous two models. The power and volume buttons have moved south, which will be good news for the small of hand, and the twin BoomSound speaker grilles remain noisily in place.

What the M9 has in spades is HTC build quality. It feels solid. Put it face-down on a table and there's a satisfying

fwump as the perfectly flat front expels a slice of air. It's still a 5in 1080p screen but an improved panel, says HTC. But we're not listening. We're *fwumping*. The main camera has more megapixels than the M8's, but loses the extra Duo lens — which was clever, but I think I can live without its refocusing trickery.

The shiny gold trim makes it flashier than previous Ones, which is a matter of taste; there's a dark grey finish with darker 'oxidised' edges that I rather like.



WINDOWS 10

Microsoft's latest OS will be free for everyone using Windows 7 or newer. That's just the kick-off...

1 Oh, hello Cortana

A new desktop conjoins the best bits of the tiled Start screen with the old-school format. And now you ask Cortana, by voice or by type, to find your lost stuff.

2 Touch-friendly

Because Windows devices are available in a smorgasbord of form factors, Win 10 recognises different device states and auto-optimises for touchscreen or keyboard inputs.

3 We're fragging family!

Xbox is built even further into Windows 10, extending beyond account management and social aspects to actually streaming games from your console to your PC or tablet.

HOT FOUR #2

HOLO, HOLO, HOLO... WHAT HAVE WE HERE, THEN?

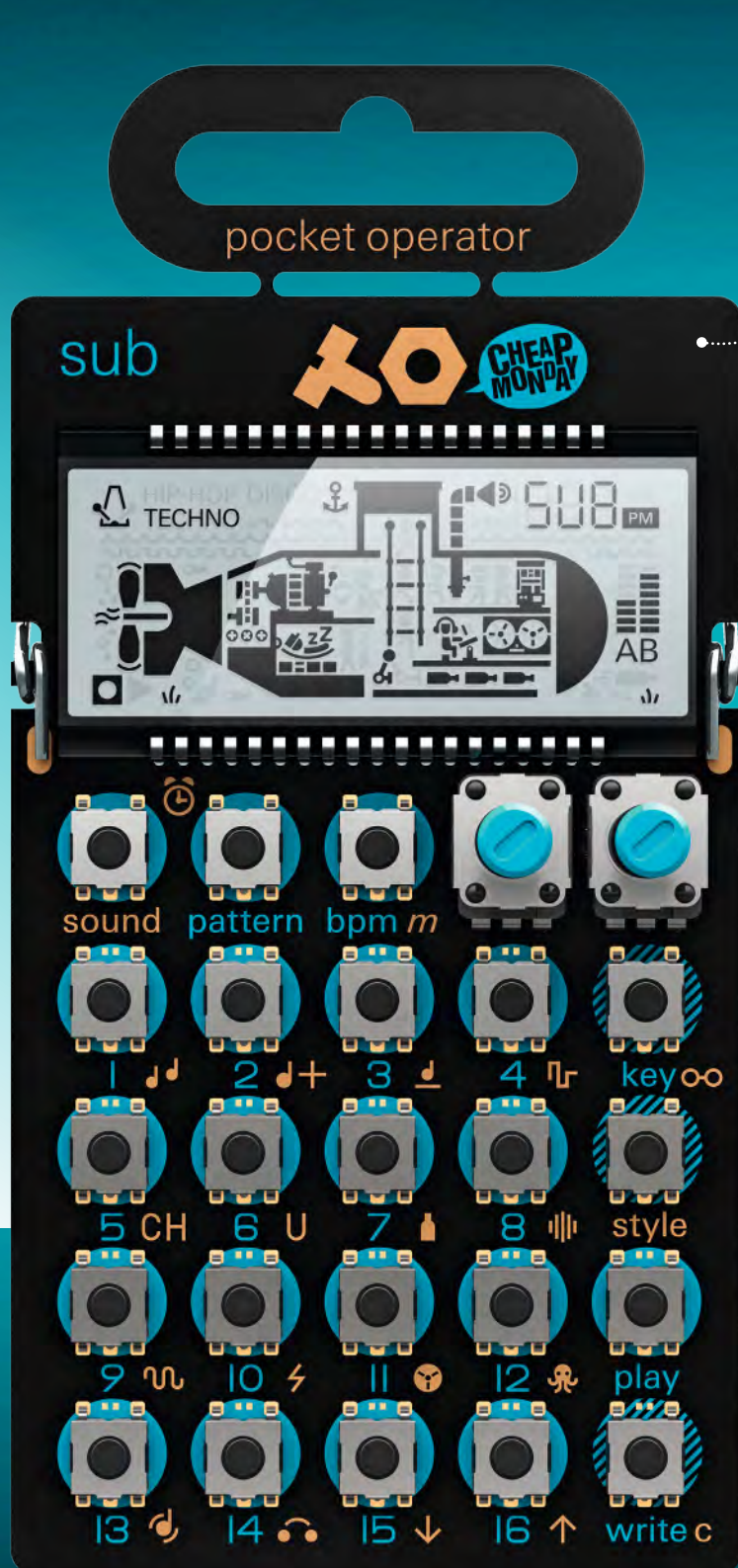
Microsoft HoloLens

There we were, parked in front of our computers for what we thought was going to be a long webcast boreathon about Windows 10, and then Microsoft dropped the HoloLens on us. We nearly choked on an Iced Gem. The HoloLens is a standalone headset that projects high-definition 3D holograms into your world. Concept videos showed creators manipulating a 3D render of an object – say, a motorcycle – in real time, or using a toolkit to build a toy rocket that could then be sent off to a 3D printer. All very marvellous, if a little fantastic. But Microsoft says it'll be in production during the life cycle of Windows 10, and will be priced for consumers.

As hot as... the lovechild of Google Glass and Oculus Rift

Etba (concept) / microsoft.com





pocket operator

The three pocket
synths each have
a 3.5mm audio
output as well as
a built-in speaker

HOT
FOUR
#3

WEAR'S THAT BEAT COMING FROM?

Teenage Engineering Pocket Operator

The story goes that Teenage Engineering, known for their awesome but expensive OP-1 synth, asked fashion brand Cheap Monday to source them some lab coats. The folks at Monday said, "We'll make your engineers some coats if you make our lads and lasses some wee synths." And so the Pocket Operators were born. There are three models of the pared-back, battery-powered noise boards: the PO-12 'Rhythm' drum machine, the PO-14 'Sub' bassline generator and the PO-16 'Factory' lead synth. Each has a 16-step sequencer with 16 sounds and 16 effects, as well as a speaker and an alarm clock.

As hot as... '70s LED pocket calculators
€70 / teenageengineering.com

HOT
FOUR
#4

DO THE HAPPY, HAPPY SHAKE

Olympus OM-D E-M5 Mark II

Oh, such love there was. We and the original OM-D walked out every evening and made beautiful pictures together. Then, without event or outcry, that love waned. But the time for pining is gone, for a second OM-D has come to town. It still has a 16MP sensor but with a 5-axis image stabilisation system that promises sharp handheld shots at a 1/4-second shutter speed. And that lithe 417g waterproof body doesn't exactly hurt the eye either.

As hot as... an athlete with mind of
Newton and eye of Bailey
from £900 (body only) / olympus.co.uk

HEAD TURNER MEETS HEART STOPPER

The new Lexus RC F



One of the most amazing high performance sports cars we've ever created. Naturally aspirated, hand built 5.0-litre V8 with 470 bhp. The next chapter in the Lexus F Story. Discover more at [Lexus.co.uk](https://www.Lexus.co.uk)

RC F

 **LEXUS**
AMAZING IN MOTION

RC F prices start from £59,995. Model shown is RC F £60,620, including optional metallic paint at £625.

The MPG figures quoted are sourced from official EU-regulated test results. They are provided for comparability purposes, and may not reflect actual driving experience.

RC F fuel consumption and CO₂ figures: urban 17.5 mpg (16.1l/100km), extra-urban 36.2 mpg (7.8l/100km), combined 26.2 mpg (10.8l/100km), 251g/km CO₂ (35% BIK)

BUSINESS GLASS

HP Pro Slate 12

£565 / hp.com/uk



Waiting impatiently for a super-sized, stylus-ised Apple iPad Pro? HP already has an Android-powered, 12-inch hyperslate...

● Why the big face?

Because it's a 'Pro' device. You see, professional tablet users are like Johnny Mnemonic and Crash Override: they need screen space to perform their art. And at 12.3in, this HP Pro Slate certainly has real estate. What it isn't, however, is wide – pro tableteers don't watch movies. They do important things to documents and presentations

on its 1600x1200 screen – which they hold in portrait, because that's the way you hold important things.

● Ooh, nice pen.

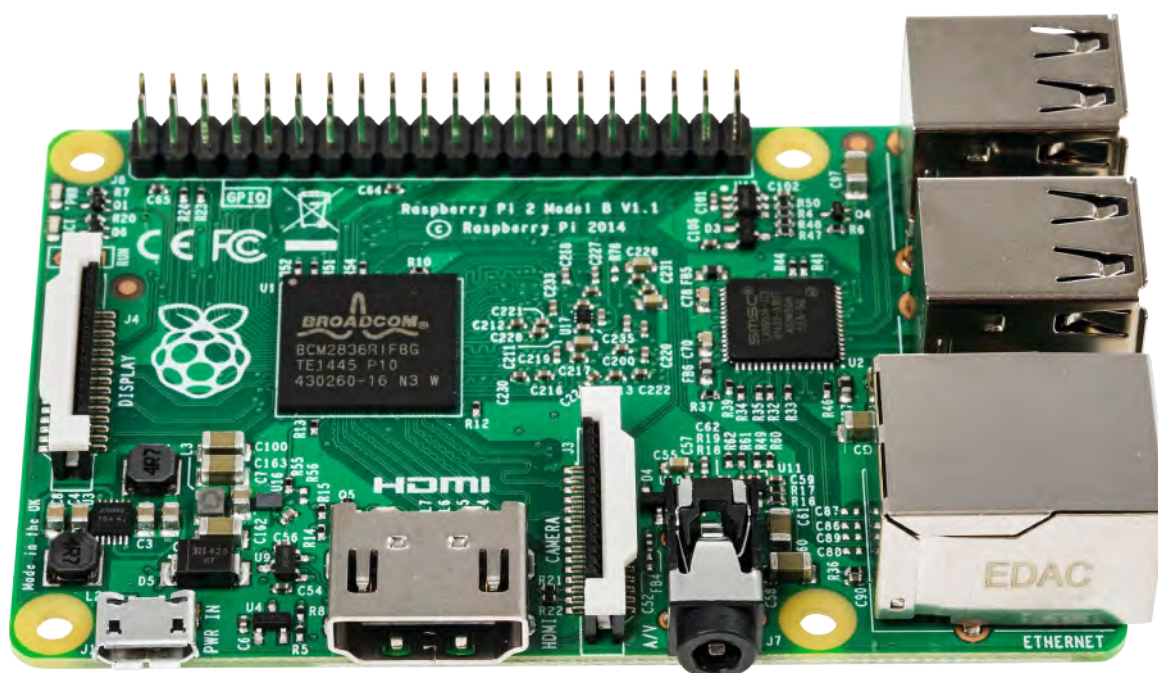
We'll assume you're not being sarcastic, because the Duet Pen is one smart scribbler. It has a proper ink nib and what you write on the paper appears on the screen. It uses a Qualcomm-designed system whereby the pen emits an ultrasonic squeak that's picked up by five microphones on the tablet and used to, um, quintangulate its position. The advantage is it doesn't need special paper, like Livescribe

pens do, but the paper does need to be in a particular place in relation to the tablet – see HP's E80 Paper Folio case, pictured above. You can also use the pen as a normal stylus, by reversing the ink nib.

● What's in the box?

Powering the Pro Slate is a 2.3GHz quad-core Snapdragon 800 processor. It has 2GB of RAM, a rather paltry 32GB of built-in storage but a microSD card for upping it. Its weight, without a case, is 850g – twice that of an iPad Air, and don't even talk to us about the iPad Pro rumours. But do, though.

'PROS' DON'T WATCH MOVIES; THEY DO IMPORTANT THINGS WITH THEIR TABLET IN PORTRAIT



Pi'ers more gain RASPBERRY PI 2

Fans of the original ultra-cheap, amazingly dinky, let's-get-coding Raspberry Pi computer will be glad to hear that it's been superseded. Don't panic! All your existing Pi projects are still compatible and the hardware is the same design, size and layout. Pi 2 jumps from a dual-core to a quad-core ARM Cortex A7-based

Broadcom BCM2836 CPU, with a maximum clock speed of 900MHz. Power consumption is as important to Pi'ers as processing power, though, so the chip is designed to idle at lower clock speeds to keep it lean. RAM has doubled to 1GB and is now on a separate chip to the CPU – otherwise all remains the same: four USB 2.0 inputs, Ethernet, HDMI, microSD, and a 40-pin GPIO interface for talking to peripherals. Best of all: still £30!

[£30 / raspberrypi.org](http://£30/raspberrypi.org)

MY GADGET LIFE



THE RASPBERRY PI GUY

British coder Matthew Timmons-Brown, 15, has a Pi tutorial YouTube channel with 35,000 subscribers

I've only had a Pi for two years...

...but now my channel covers topics ranging from Python coding to in-depth robot tutorials. It's remarkable, given that when I first saw the Raspberry Pi (in *Stuff!*) I had no idea what it could do. By far the most popular, and by chance also my favourite, are electronics tutorials about wiring up your Pi to motors to create robots.

The launch of the Pi2 is a crucial step.

As [Pi inventor] Eben Upton said, the Pi is a good computer for £35, whereas the Pi2 is just a great computer. Unfortunately, I've got 11 GCSEs to get out of the way before I can really get to work on Pi2.

A lack of backwards compatibility could have been a disaster.

Three years of videos and two million views would have been rendered old news overnight! But thankfully the new board can run all of the same projects as the old one.

There are plenty of rivals out there.

But although the likes of Imagination Technologies' CI20 and BeagleBone are theoretically capable of more, they can't match Raspberry Pi's extensive community – loads of qualified teachers building up resources and forums packed with people willing to help you. It's the Raspberry Pi Foundation's educational

goals that have helped it get the worldwide backing it has today.

The Raspberry Pi is creating the next generation of Zuckerbergs and Musks.

I fully intend to use my Pi skills in my career. It's so exciting that you can create something amazing in your bedroom then share it with thousands of like-minded coders around the world. Gabe Newell, of Valve, summed it up nicely: "The programmers of tomorrow are the wizards of the future."

Look out for Matthew's Pi 2 tutorials (once he's finished his exams) at theraspberrypiguy.com



The light one LENOVO LAVIE Z HZ550

You are a maximalist. You pride yourself on being prepared, whether that be a first aid kit, a battery or a thing for getting mice out of an elephant's nightmare. But you don't pack heavy. You whittle and you research and you shed the unnecessary and, as such, your laptop is this unbelievably lightweight Lenovo. It might not win any style points, and its battery life is a mere 5–6 hours, but this 13in, 2560x1440–screen laptop weighs just 780g. That's 570g less than a 13in Macbook Air. It is, though you care not, 5mm thicker than the Samsung.

from US\$1300 / lenovo.com

The thin one SAMSUNG ATIV BOOK 9

You are a minimalist. Weight you can handle, as a result of hours in the gym reducing your body fat percentage to that of a marathon runner. But you abhor bulk. You want to slice through life's headwind with the minimum of extraneous protuberances. So your laptop has to be slim...and they don't come a lot thinner than Samsung's 11.8mm-thick Ativ Book 9 with Intel Core M processor. It has a smaller screen than the Lenovo – a 12.2in, 2560x1600 panel – but it makes up for it with superior 10hrs-plus battery life.

from US\$1200 / samsung.com



START MENU

The month's best concepts, start-ups, crowdfunded projects and plain crazy ideas



Listen to the hand

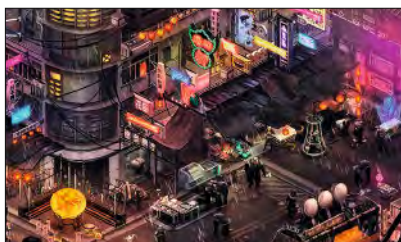
SMRTGRIPS

from US\$59 / smrtgrips.bike

The smartification of everything continues apace: this time it's your bicycle handlebar grips getting an upgrade. Now they'll look after the humdrum aspects of cycling while you enjoy the ears-flapping-in-the-wind freedom. They'll vibrate for direction changes, track your bike and even offer rudimentary group control when you're riding with other SmrtGrips users.

Status

Seeking funding (Indiegogo)



More running, different shadows

SHADOWRUN HONG KONG

from US\$15 / harebrained-schemes.com

You'd think one reboot of the '90s RPG franchise might have been enough, but here we are on the third – and *Shadowrun Hong Kong*, for Mac, Windows and Linux, is already 800% funded. The tech-meets-magic universe and turn-based squad gameplay will be familiar, but the Hong Kong locale will be all new, and no doubt rendered in fascinating detail.

Status

Funded (Kickstarter)



Ten charged phones sitting on a wall

LIFEPower A2

from US\$250 / lifepower.be

Don't you ever wish you had a portable wall? Plenty of uses for a wall. Shelter and, if it has cavity insulation, warmth. Handy if you need an impromptu goal for a game of headers 'n' volleys. And, of course, it could have a socket to charge your gadgets. Such a wall does not exist, but this 24,000mAh battery pack with wall-like 240V output does. It can completely recharge a Macbook Pro and weighs 790g.

Status

Funded (Indiegogo)

iCandy

THE RASPBERRY

THE PERFECT CHOICE FOR URBAN ADVENTURES



reddot award 2014
winner

www.icandyworld.com

G I G A P I X E L

The bigger picture in tech



LAPKA OPENS A NEW ERA FOR ARA

Project Ara is a smartphone recently imagineered by Google with interchangeable modules including batteries, cameras and memory. It was reimagineered by us in last October's issue with a shaver head, a Geiger counter and an airbag. And now, it's been more sensibly imagined again – despite the strange colour scheme – as a multi-talented tool for health professionals. Lapka's version includes sensors for air quality, CO₂, blood glucose levels, UV light and heart rate. It also has a breathalyser module (pictured above), all of which might make it more of a developed-world tool.

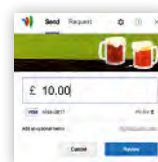


NEWS FEED



QUIT FUELLING AROUND

Shell and PayPal are to offer app-powered petrol payment. So long as you've trained your children to do the actual filling, you need never get out of your car again. The system will launch in April, initially only for Shell Drivers' Club members.



YOU'VE GOT MONEY MAIL

Google Wallet users can now send money to each other using email. The sender needs to be using Gmail, where they can add digital cash as an attachment, but the receiver can be using any program. Now, where's that tenner you owe us?



STUFF.TV GETS KILLER NEW ENGINE

You may have noticed that Stuff.tv, The Best Website On The Internet, has had a haircut. Actually, websites don't have hair, but the design and the rendering have been coiffured. The mag, meanwhile, continues with its even higher-res 'Inky Treemash' engine.

INGENI-O-METER ●●●●● Deliver desire first, then function for dessert



I MADE THIS



THE WEARABLE THAT'S REALLY WEARABLE

Mike Bell of Intel tells us why the MICA is fashion first, function second

Intel is into wearables in a big way: it launched the button-sized Curie chipset to enable better devices and holds big-prize 'Make It Wearable' competitions for the people who make them. So why was one of Intel's first wearables designed not to look like a gadget?

We introduced MICA at New York Fashion Week. We've worked hard to forge relationships with fashion brands because, although people are predicting 50 billion Internet of Things devices by 2020, that's not going to happen unless they are things that are desirable – that consumers actually want. MICA was developed in association with a New York fashion house called Opening Ceremony, and I think people would actually buy one without knowing that it had technology inside. And then they find out that they can get their

social updates on it – that they don't need to 'load' or 'pair' or do anything geeky – and suddenly they're fascinated. And you've got yourself an audience for wearables that previously didn't exist.

How did MICA lead to Curie, the button-sized wearables chip?

Designing something specifically for wearables is very different to taking a low-end cellphone part and making it do a new job inside a wearable. Curie had to be built from the ground up to be small enough to fit into any sort of device, but also be a stable hardware platform with great software that will help people get their devices to market quickly. At the moment developers tend to test ideas using an Arduino board, but it's kind of difficult to strap one of those to your wrist. So Curie is ready to begin prototyping on

straight away: it has an efficient processor, and it has some Intel-developed sensor processes that figure out – using very little power – whether you're walking or running or fishing or whatever. And it has Bluetooth LE and accelerometers and everything else, so just add a battery and your own cool secret sauce and you have a wearable.

attacking from both sides, by developing the fundamentals ourselves but also looking for other companies to work with on power usage.

Are people approaching wearables in the wrong way?

One of the things I see is that everyone seems to be trying to create the Swiss Army Knife of

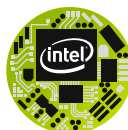
“I THINK PEOPLE WOULD WANT ONE WITHOUT KNOWING IT HAS TECH INSIDE”

Battery life is a hot topic for wearables. Have you seen any new developments in that area?

There are certainly some good start-ups in the Bay area working on... I won't just say batteries, but power delivery in general. And, of course, we are doing our part to really bring down the power consumption of the chip itself. The whole architecture has to be designed to use the minimal amount of power for a task, and it's actually a pretty hard problem – one that we are

wearables. They do everything: they open my garage door, they cook my breakfast, they give me instantaneous heart rate when I push a button. I'm not sure how useful that is, having a snapshot of your heart rate. I think what you're going to see more of is specialised wearables. Some may be a very simple device with a few clear functions that makes you think, “Wow, how did I live without this?” – a fitness wearable, or a work device, or even something for fashion, like MICA.

INTEL CURIE: THE FACTS



32-BIT
INTEL
QUARK
CHIP

80KB
SRAM

6-AXIS
MOVEMENT
SENSOR

LOW-ENERGY
BLUETOOTH



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War ain't smart POLAR A300

Remember MiniDisc? How Sony launched it, then other companies got licensed to have it too. Suddenly there were portable recorders and personal players and car head units, and everyone was using it...and then there was the war. Remember? Society fought bitterly about the fractionalisation of the MiniDisc industry and eventually destroyed itself; we all had to go back to living in caves and banging sticks together for Saturday night LOLs. Well, so it is now with watches. But for the moment, diversity brings marvels, and competition brings prices down. The Polar A300, for example, doesn't have GPS, but it will track steps and movement, as well as heart rate via a chest strap. It has Bluetooth Smart for data transfer and, soon, smart notifications. Nice. But nothing to start a war over, hmm?

£150 / polar.com/uk-en

Jam scan-whizz TOMTOM RIDER

The original TomTom Rider motorcycle sat-nav didn't have any capability to factor live traffic problems into its decisions. Sure, bikers don't have to worry as much about jams, but threading your way up the side of a queue of irate car drivers is not much fun and best avoided. So leather-clad fists in the air, then, for the Rider v2, which does have smartphone-assisted traffic info. It adds the ability to hunt out hilly roads to its wheedling of wiggly roads, and it has a new portrait orientation mode.

£tba (due April) / tomtom.com



↓ DROP EVERYTHING AND DOWNLOAD...

The Doctor And The Dalek

£free / Android, iOS, Kindle Fire

Chances are your kids have already programmed and installed Raspberry Pi-based cranial augmentations. It's part of Key Stage 2, isn't it? If not, then you need to get them on the path to programming pretty damn quickly, and this thickly veiled coding lesson from the BBC might be just the thing. Simplistic platforming levels make way for drag-and-drop coding puzzles, helped by the voice of the Doctor, Peter Capaldi. Of course, you'll have to play it through yourself, just to check its suitability. Exterminate! Ahem.





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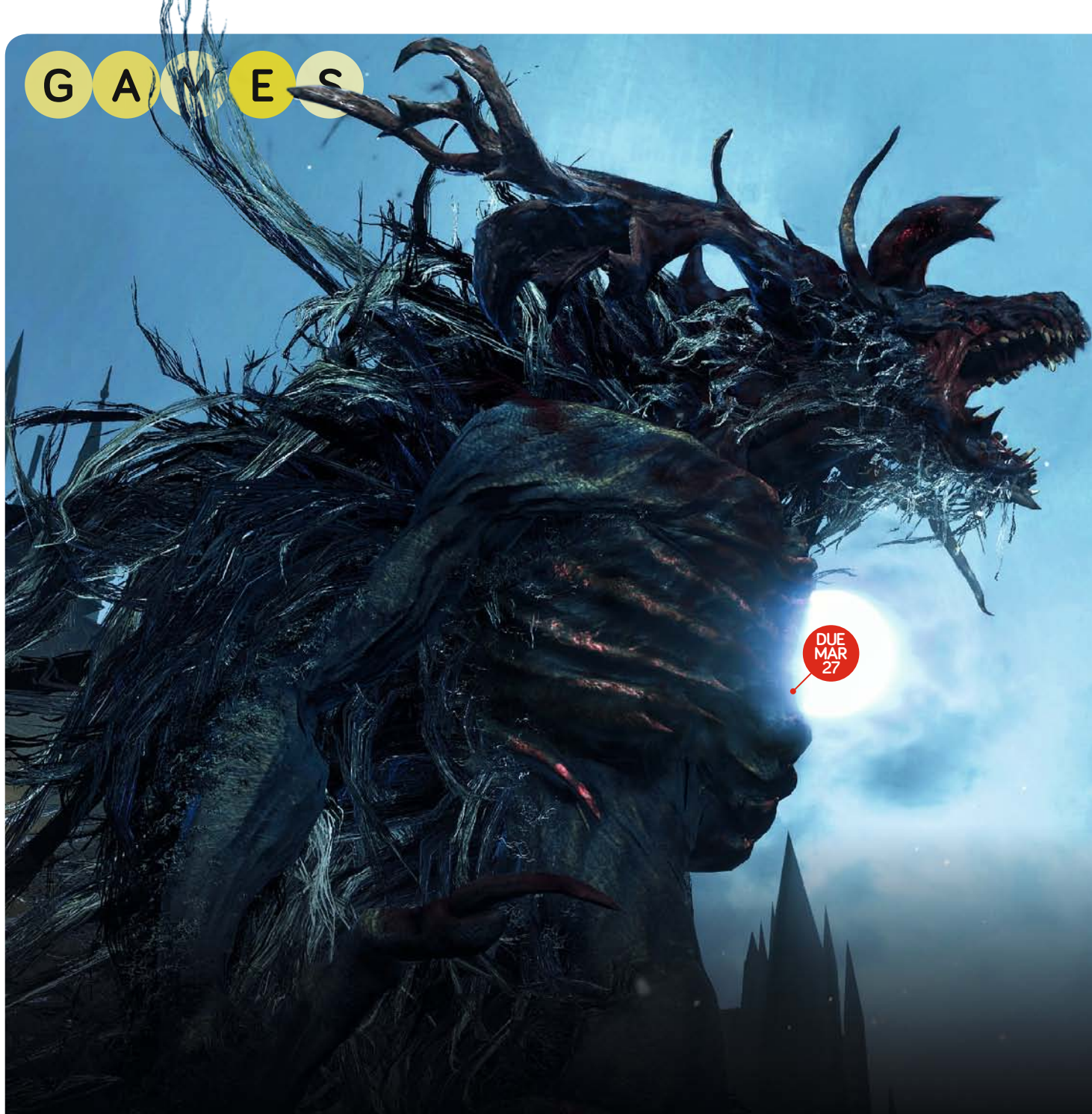
3RD MAY, 2015

SILVERSTONE, 12:00 P.M.

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WINGSFORLIFEWORLDRUN.COM



FIRST PLAY BLOODBORNE PS4

Hidetaka Miyazaki isn't just the creator of two of the best dungeon crawlers of all time (*Dark Souls* and *Demon's Souls*); as far as ultra-hardcore gamers are concerned, he also represents a time when games used to be difficult. His latest is every bit as intimidating as anything else on his CV.

Visually, *Bloodborne* is close to exquisite. It's set in a nightmarish necropolis called Yharnam, which looks like Gotham City designed by HP Lovecraft — all gothic spires, swirling black clouds,

and flickering streetlamps that illuminate the grisly creatures that stalk its cobbles.

There's a lot in PS4-exclusive *Bloodborne* that *Dark Souls* fans will find familiar. Players have heavy and light attacks, a dodge-roll and a quick-heal, plus you can see the ghosts of other players where they met their untimely demises. Oh, and the checkpoint system is eye-wateringly unforgiving.

However, it also has a couple of new kinks in its gameplay. You can dual-wield weapons — ranged and melee — and some

of them have two settings. The wicked-looking scythe the protagonist carried in our demo, for example, could be extended with a flick of the L1 button.

The key to surviving is to treat every monster you face with respect. Assuming that a large lumbering beast can't move with astonishing speed is the easiest way to get killed — and once you're dead, all the enemies you destroyed become unhelpfully reanimated.

It's dark, bleak, grim, but oh so inviting. Prepare to die. Over and over and over again.



FIRST LOOK LARA CROFT'S NEXT HOLIDAY

RISE OF THE TOMB RAIDER

Xbox One, Xbox 360

Lara Croft's been lying low since her latest Xbox-exclusive adventure was announced last summer, but we now know that she'll be back in *Rise Of The Tomb Raider* at the end of this year.

Set a year after she survived being shipwrecked and almost sacrificed on the island of Yamatai, Lara's feeling the effects of her ordeal, so just like anyone would do, she's taken herself off to Siberia in search of a mythical sunken city called Kitezh to find out the secret of eternal life.

In the spirit of the original *Tomb Raider* games from the '90s, Lara's greatest adversary is the harsh environment, with wolves and bears trying to kill her when avalanches or other natural events aren't.

As is *de rigueur* in almost every new game these days, there's a *Far Cry*-inspired crafting system that'll allow Lara to create and upgrade items to help her fight the elements. Some might require things that can only be acquired after dark, such as a wolf pelt, suggesting it'll have a meaningful day/night cycle. Just don't expect to get much rest.



COMING SOON MOBILE GAMES



JOE DANGER

new to Android

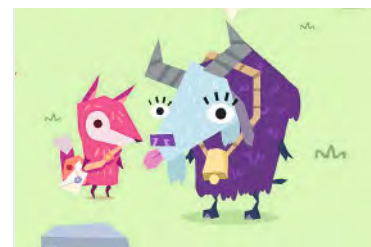
While we wait for Hello Games to finish *No Man's Sky* it's worth spending some time with one of their other games, such as *Joe Danger*, who is flipping his bike onto Android for the first time. There are 80 levels in which to try to kill the unkillable stuntman, and gamepads are supported.



THE ROOM 3

iOS, Android to follow

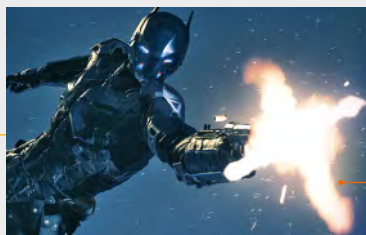
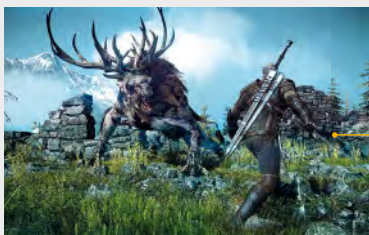
Considering how many awards *The Room* and *The Room 2* won it's amazing there's still any space in there for puzzles, but the third piece in this touchscreen trilogy is due this month. Expect the kind of teasers that'll distract you during the day and keep you up at night (in a good way).



LETTER TALE

iOS, Android to follow

With a bizarre back story involving carrier pigeons, a lost fox and some missing post, *Letter Tale* is no macho FPS. You are Ari, a fox taken under the pigeons' collective wing, and it's your job to deliver the post. Doing so (and finding out where you're from) will require smart problem-solving.



INCOMING

APRIL

- MORTAL KOMBAT X
- DARK SOULS 2: SCHOLAR OF THE FIRST SIN

MAY

- THE WITCHER 3: WILD HUNT

JUNE

- BATMAN: ARKHAM KNIGHT

JULY

- LEGO: JURASSIC WORLD

NEW MELODY MAKERS

This is the time of year when synthsmiths and string-jockeys get all excited over the latest noise-creating gear releases

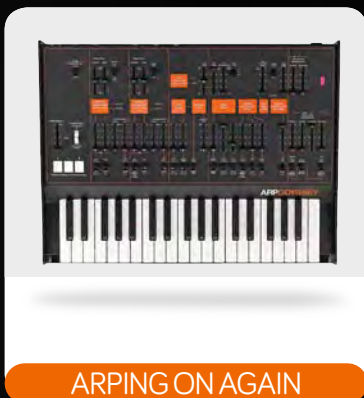


GUITAR TUNESER

Blackstar ID: Core Beam

None of the political parties have mentioned a speakers-per-family limit as part of their election manifesto. But to make sure you're not caught unawares, secure yourself one of these 20W guitar amps that double as a Bluetooth speaker. The 'Super Wide Stereo' mode promises room-filling sound, and there are six guitar modes to play with, while a USB output lets you capture your experimental strumming on PC for future fans to discover and fawn over.

£230 / blackstaramps.com



ARPING ON AGAIN

Korg ARP Odyssey

Tumbleweed was seen rolling through parts of January's NAMM music show in California as virtually everyone was at the Korg stand for the reveal of its new-old ARP Odyssey synth. It's claimed to ape its 1970s predecessor from top to bottom... except that it has a switch to hop between the filter circuits of the three original versions of the Odyssey, plus it has USB MIDI for your modern-type music-making. Want one? Better be quick, say we.

from £780 / korg.com



HIT THE ROAD, JACK

Jack

Think of all the fun times you've had with guitar leads. The time you jumped onto a monitor, got caught in your cable and knocked yourself out. The time you forgot the cable altogether. All these times are in the past now, thanks to Jack, a Wi-Fi sender for your guitar. Pick up the signal on your phone or laptop, or use another Jack as a receiver for your amp or PA. Use several Jacks for different guitars without interference, and (the company promises) enjoy almost zero lag on the signal.

£100 / wifi-guitar.com





Skateboarding: it's in the sole, man NIKE FREE SB

When Nike's Free running shoes first arrived and we saw how their segmented soles allowed for free-'n'-easy, barefoot-style running without the free-'n'-easy bleeding that comes with not wearing shoes to run outdoors in a city, we immediately began cutting segments into all our shoes with a bread knife. An expensive shopping trip later, we're prepared to admit Nike knows what it's doing. These new SBs – the first to incorporate Free tech into a skateboarding shoe – promise the thin-sole sensitivity of your old Chuck Taylors, but with more freedom of movement. What's lot to Nike? **£85 / nike.com**

AR a nice pair of goggles RIDEON AR GOGGLES

Knowing where you're going when the snowing is a-flowing is the Holy Grail of snowsport accessorising. Flimsy paper maps or apps both require taking off gloves – brrrr, no thanks. While we've seen goggles with head-up displays before, these ones claim to fully augment your wintry reality. A forward-facing camera, accelerometers, GPS, locally-stored piste data and a right-eye display give you direction arrows that 'lie' on the terrain, indicating routes and their coloured difficulty rating. There's also fun features like virtual slalom gates and pop-up video messages from your skiing buddies. **[Etba / rideonvision.com](http://Etba/rideonvision.com)**



FUTURE STUFF DENT-DETECTING DOORS

Fraser Macdonald discovers how mystery markers could soon be brought to justice

Ever get back from the weekly shop to find some ruffian has left an unsightly dent in your car door? German manufacturer Hella has invented an 'intelligent damage detection system' that could alert you when the impact occurs and tell you how intensive it is – potentially from a scale of 'minor dink' to 'Hulk smash'.

The system uses sensors that can be glued behind door panels or attached to existing parking sensors. If a car has onboard GPS, Hella's system will be able to tell the

driver where and when a dent, scratch or impact happened.

So far, so what, right? Why do you need to know about damage to your own car? Because you don't have your own car, *in the future*. Personal car ownership isn't factored into the connected hypercities of tomorrow.

Google's self-driving cars, for example, won't be privately owned – you'll be assigned the nearest available one via the app. Both Audi and Ford, meanwhile,

have talked about the potential change to a community motoring lifestyle.

The success of car sharing schemes such as Zipcar marks a behaviour change from having a four-wheeled resource hog in the drive. Book a Zipcar today, though, and you have to begin your experience by manually checking for dings and correlating them with the damage book. This Hella system will have done that for you, with repair fees automatically attributed to the correct user. And it could begin doing it as soon as 2018.

STYLISH CYCLING

Black shades, grey gloves, looking sharp and looking for love

1 POC DO

Eyes: we've all seen them. What's hot on the cycle superhighways this year is the not-seeing of them. And POC, made glorious by styling up the eyes of various road racers, has plenty of polarised or photochromic peeper-keepers. [from £135 / pocsports.com](http://pocsports.com)

2 Giro Hoxton LF

We know what you think – you think the 'LF' stands for 'long-fingered'. And you're right. But you know what else? 'Lovely fingers'. Protected by these luxuriously unsporting Merino and soft suede gauntlets. [£35 / alwaysriding.com](http://alwaysriding.com)

3 DZR Jetlag Nero

These might look like flippity-floppety plimsolls but they are actually highly cycle-specific. Clippy-pedal SPD cleat fixings are cut into what is a remarkably stiff sole – just the thing for burning away from the lights. [£85 / alwaysriding.com](http://alwaysriding.com)

4 Velorution Vintage MTB

Biking bazaar Velorution now has its own range of nouveau-vintage cycling shoes – there's reflective material behind them speckles! Choose from road or SPD cleat versions, in brown or black leather. [£105 / velorution.com](http://velorution.com)

5 Brooks Islington

It's made from weatherproofed cotton and leather, with chunky buckles on the arm straps that can be crossed over for more stability. It's just about big enough to contain the money, in fivers, that you need to buy one. But it's a lovely bag. [£295 / brooksengland.com](http://brooksengland.com)



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that's anything
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We hear you. You want it all. A car that speaks volumes, comes in a variety of loud two-tone colours, 18" Alloys, 8" Touchscreen Satellite Navigation, DAB Radio and an 8 Speaker Infinity® Premium Sound System. Yes you're so demanding. Luckily, so are we.



Fuel consumption figures in mpg (l/100km) for the All-New Kia Soul 'Mixx' range are: Urban 37.7 (7.5)–46.3 (6.1), Extra-Urban 54.3 (5.2)–64.2 (4.4) and Combined 47.1 (6.0)–56.5 (5.0). CO₂ emissions are between 158–132g/km. MPG figures are official EU test figures for comparative purposes and may not reflect real driving results. Model shown is Kia Soul 'Mixx' 1.6 CRDi 6-speed manual 126bhp.

THE FIRST SIX APPS YOU'LL INSTALL ON APPLE WATCH

If you buy Apple's wearable next month, you'll want to book a day off to muck about with it. Here's where to start...

INSTAGRAM

That little screen isn't going to do much for your DSLR pics...

But as anyone with more than three Insta-followers will know, it's not about what you snap but to whom you show it. By putting Instagram on your wrist, you'll be able to tag, comment and like (and, more importantly, be liked) at a moment's notice.

DOMINO'S

Because the Moto 360 shouldn't be the only watch that lets you order a pizza

Domino's could be called the Apple of the takeaway world. Its apps – for ordering and tracking your cheese discs – are a huge success. Hey, maybe Domino's will release a wearable that lets you order apples! Or maybe not.

STARWOOD SPG

Swiping you in to your super-swanky W Hotel

SPG is already available for your phone, but it was one of the apps Apple showed off at the Watch unveiling: it's for checking in, checking out and... "Can you really open the suite door with just your watch?" "Finish your cocktail and I'll show you."

BMW / TESLA

An app for starting, stopping and even summoning your electric supercar

From what we saw at CES in January, no self-respecting future-mobile will be without a companion smart watch app, and Apple is already making noises about apps that will work with an i3 or a Model S.

APPLE HEALTH

Okay, so this'll probably be installed already...

...and according to some (see below), it's the most important Watch app of all. It'll collect data from fitness apps like Strava and Nike+, but it'll also use a stylish activity monitor to nudge you when you get to your third hour of PS4-and-Wotsits.

APPLE PAY

Buy anything with your iPhone, your Apple Watch... but not your iPad

Insert digital versions of your debit cards into your virtual wallet and you'll be able to tap-to-pay (like with a contactless card) with your watch at many big chains. Your local ironmonger, on the other hand, will find your watch-waving confusing.



An Apple Watch a day...

MARK PAYTON
@iammarkpayton



The Apple Watch has the potential to transform healthcare.

Already the NHS medical director, Professor Bruce Keogh, has predicted that wearables could enable doctors to detect if you are about to have a heart

attack. But of course, this also raises issues of privacy: you're strapping a potential spy to your wrist.

Top mobile app developer Mubaloo, however, points out that HealthKit – Apple's repository for health data – demands that users grant permission before giving away personal information.

Olly Berry, Mubaloo's head of iOS, says: "HealthKit lets users see their activity, and part of this comes from Apple allowing third-party apps to put their data in there and merge it, with the user's permission."

"This could be a huge opportunity for third-party services and accessory

manufacturers, along with healthcare as a whole.

"While the likes of the Moto 360 periodically check your heart rate, the Apple Watch recognises when you exercise to start monitoring your heart rate, and reminds you to stand up every hour if you've been sitting for too long."

D5500

"You don't need many ideas, only a new perspective."

Andrius Aleksandravičius

I AM DIFFERENT

Shot by Andrius Aleksandravičius in Valencia
with 14-24mm NIKKOR | Exposure 1/100s | ISO 500
Photo © Andrius Aleksandravičius



Photographer Andrius Aleksandravičius expresses the full potential of his creativity — and so can you. Turn your ideas into great images with the advanced technology of the D5500. Get inspired by Andrius' full story and take your photography to the next level with the D5500. Visit europe-nikon.com/iamdifferent



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NIXIE MACHINE

£17,600 / mbandf.com/mad-gallery



Ah, so that's where all of time comes from.

Yep. They say that when the Big Bang had its titular event, it flung out all manner of exotic gases and base materials and the little fizzy bits from Wham bars and... this. And thenceforth, there was time. Accruing, inexorable foreverness. And yet, for all that it looks authentic, you won't believe what you'll discover if you carbon-date this enigmatic machine.

That it was forged at the very dawn of anything?

No, that it was made a week or so ago last Wednesday. Or thereabouts. Which tells us something exceedingly important. Either that the Nixie Machine is able to exist simultaneously in all times, or that you can't carbon-date something that pre-dates carbon, or that this is actually just a really, really nice clock. Made by German artist Frank Buchwald.

What? It was made? By a person?

Sadly, yes. But very meticulously, using no fewer than 350 components, almost all of which were created out of raw metal by Frank's hands (and lathe), making each machine a perfectly original timepiece. Except, that is, the Nixie tubes (the rather brilliant lightbulb-type display) that do the time-telling. They are part of a stock of 1960s tubes found sealed in a Bulgarian army depot.

So, it no more knows time than you or I know time?

Oh, it's cleverer than that. It contains both a GPS receiver for the getting of space-time and a DCF77 chip for hearing the atomic-clock time signal all the way from Germany. In fact, such is the manufacturing complexity, and the rarity of the tubes, that only 12 of these Nixie Machines will ever be made. Or will have already been made.

THE 1960s
NIXIE TUBES
WERE FOUND
SEALED IN A
BULGARIAN
ARMY DEPOT





Canon EOS M3

In the pink corner we find Canon, who ought to know better than pandering to crazes. This has a 24.3MP sensor, DIGIC 6 processor and 49-point autofocus system. It can use any of Canon's EF lenses, which is ace.

£600 / canon.co.uk



Fujifilm X-A2

Here is the orangey, browny, leathery X-A2, which also comes in a more subtle black. It has a 16.3MP APS-C sensor and comes kitted with a 16-50mm lens. Which makes it something of a bargain.

£440 / fujifilm.co.uk



Samsung NX500

Looking pretty futuristic is the little sister of the NX1. She's light, but can capture 4K video with a super-high-res 28MP sensor and a wide ISO range of 11-25600.

£600 / samsung.co.uk



Panasonic Lumix GF7

The GF7 really ought to be feeling ashamed of itself, with its hands-free selfie mode and 'slimming' filter. But no, it's big and proud with 16MP sensor, Wi-Fi and AVCHD movies.

from £440 / panasonic.co.uk



THE FADTASTIC FOUR
VS
SELFIE-SCREEN SNAPPERS

? WTF IS THE BMW X6M?

Argggh! My eyes!

We'll agree it isn't the prettiest, but this is one menacing SUV you wouldn't want to mess with. BMW's M division has taken the spanners to the latest X6 model in order to create a freakishly fast Franken-car that's capable of devouring the racetrack while transporting five occupants. The trick lies underneath that heavily sculpted bonnet in the shape of a 4.4-litre, twin-turbocharged V8 engine that's one of the most magnificent things we've heard, producing a frankly ridiculous 568bhp and 750Nm of torque.

How does a bloater like that go around corners?

It's a miracle of engineering, really, because despite featuring the typically jacked-up ride

height of most normal SUVs, it manages to remain flat and keep its grip through even the tightest bends like a car half its size. This is due to the many revisions the chaps at M Sport have made to the chassis, the xDrive all-wheel-drive system, uprated brakes and the excellent Dynamic Damper Control, which stiffens the suspension at the press of a button. There are also no fewer than ten radiators to ensure the big fella doesn't overheat during particularly strenuous shakedown.

What other neat gadgets does it have?

As with all M cars, the driver can select either Comfort, Sport or Sport Plus modes for the suspension, steering and throttle response via a switch near the gear lever. You also get



the latest version of BMW ConnectedDrive, which is one of the most intuitive in-car infotainment systems currently available. There's also a cool M-specific head-up display option that features a digital speed display, gear display, rev band and shift lights for a true *Gran Turismo* experience. Mind you, this monster costs just over £93,000, so you'd expect a few bells and whistles.

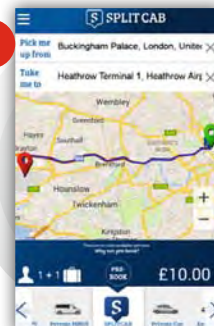
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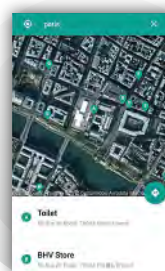
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6



9



1 Puppet Punch

Efree / iOS

Destroy pesky puppets in this fast, good-looking and surprisingly difficult game. Nimble fingers and quick reactions are required, so it isn't long before it all becomes a blur as you desperately try to keep your character, Pablo, alive.

2 Particle Mace

£2.29 / iOS

A game of most excellent purity: swing your ship around in space so that you (a) don't hit any rocks and (b) cause your towed detritus to hit rocks and destroy them. There are no ads or purchases; you just pay and play. Ahh, such simplicity.

3 Lamp And Vamp

£1.99 / iOS

The tables are turned in this tile tapper: you're a vampire trying to reach his coffin being pursued by 'do-gooders'. Stay in the shadows, pick off enemies and use your powers strategically. Do not be distracted by buxom blondes.

4 Zeek

Efree / Android, iOS

Smartphones are bringing millions of people together... so that they can sell stuff. Well, at least it's some kind of interaction. This app lets you buy and sell gift vouchers. Buy a £10 John Lewis voucher for £9, then shop like it's your birthday.

5 Flo

Efree / Android

This aims to make you a better driver by measuring acceleration, cornering and braking and giving you a score. Doesn't necessarily work, as it can't track the constant barrage of verbal abuse at cyclists as you smoothly cut them all up.

6 GrooveMaker 2

£6.99, £7.99 / Android, iOS

Apple's App Store abounds with loop-squirting, sample-tangling apps but Android tends to be less musical, so it's good to see a DJ app this capable – you can import loops, add effects and record live – arrive on both platforms.

7 Splitcab

Efree / Android, iOS

Shivering at the bus stop watching a glamorous individual hail a taxi, don't you wish you could jump in too? Now you can! Terms: you have to pre-book it via this taxi-sharing app. Currently London airport journeys only. Fees apply.

8 Adobe Lightroom

Efree (Creative Cloud subscription required) / Android, iOS

Oh, hark at you with your need to edit RAW photos on the move. Bully for you, with the ability to share them socially or sync them with your desktop Lightroom software. We are so not jealous.

9 Flush

Efree / Android, iOS

As app functionality goes, protecting you from the shame of involuntary public defecation is a real winner. Flush will help in all but the most extreme urgencies, with a database of 100,000 loos in cities around the world.

APP SPOTLIGHT LAUNDRAPP

Efree / Android, iOS

The get-rich idea of many a salivating start-up is to create an 'Uber for... something'. Laundrapp is a great example: it's the Uber of laundry. The slickly designed app (it really is nicely done) makes it easy to order the service, and your clothes are picked up and dropped off all clean and pressed. Except, it's not as cheap as many regular dry cleaners. Maybe it's more the Zipcar of laundry, then.



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Just as we build our own engines from the ground up, our Swiss manufactured saw chains are precision engineered using our own machinery, developed and built in-house. Each cutter tooth is electrolytically chromium-plated to increase wear resistance and our inductively hardened rivets create a super strong collar. This attention to detail is just one of the reasons why we're the world's number one chainsaw brand.

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Canon 5DS

from £3000 / canon.co.uk

If a normal picture is worth 1000 words, the massive 50-megapixel pics from Canon's new semi-pro snapper are *War And Peace*

● **That really is a whopping great big sensor, physically and electronically.**

In fact it's the highest-resolution sensor ever found in a DSLR camera, and it should be capable of absolutely enormous amounts of detail: printed full size on a standard 200DPI inkjet, images from the 5DS's monster 50.6MP full-framer are over a metre across. Some people will tell you that the number of megapixels isn't the big deal it once was – any camera that's into double figures will be enough for most casual shooters. But with a gigantic 50MP-plus image, you'll be able to crop into a small fraction of the picture and still see bags of detail, and for some – serious fashion photographers, landscape artists and anyone else who makes very detailed images – that surfeit of pixels will be good news.

● **But... isn't it better to have fewer pixels?**

Ah, the age-old pixel controversy. Because while more pixels equals more detail, it also means less area for each pixel to collect light – this is why HTC's Ultrapixel cameras are built with fewer pixels, for better low-light performance. But in a camera this specialised, Canon obviously has its sights on people with big flashes, reflectors and, er, daylight – those fashion fiends and landscape lovers we mentioned just now. It's even unveiled a posh new wide-angle zoom lens, the 11-24mm f/4L (£2800), which should particularly suit landscape and architectural photographers. If they have enough money.

● **Time to buy a huge printer.**

You have a couple of months to save up, as the world's sharpest DSLR goes on sale in June. At £3000, it works out at an almost cheap-sounding £1.69 per pixel.



PRINTED
FULL SIZE,
THE IMAGES
ARE OVER A
METRE ACROSS



SAVE
£2400!

● You could simply...

Buy a different camera. The new 750D and 760D replace the 700D as the cameras aimed at fledgling DSLRers. Both are similarly specced-out with 24.2MP APS-C sensors, DIGIC 6 image processors, an ISO range of 100-12,800, 19-point autofocus, 1080p video shooting, Wi-Fi, NFC and vari-angle LCD screens.

● But which one?

The biggest difference lies in the control layout. The 760D features a design more akin to the company's pricier, enthusiast-friendly models: a top-plate LCD panel, a Quick Control Dial and an Intelligent Viewfinder. The 760D also offers extra creative modes for movie shooting. Due in April, the 750D will cost £600 for body only or £690 in a kit with an 18-55mm lens; the 760D will cost £650 for body only.



Eight-legged, for geeks!
D-LINK AC3500 ULTRA

When the internet connection seems to be slow, we are prone to irrational actions. Shooing the wires on the back of the router, or moving the laptop closer to it, despite the full-bar signal indicator. You know what else might not make any difference, because you're probably being slowed by a cranky cable exchange three miles away? Buying a kick-ass red 802.11ac router, like this one, that's capable of wireless speeds of between 3.1Gbps and 5.3Gbps. It has eight aerials. And it looks like it'd solve a slow connection by scuttling up the side of the BT Tower and biting the head honcho's face off.

Etba / dlink.co.uk



Two new Mu and a Mu with a do
MU CLASSIC, MU TABLET, MU DUO

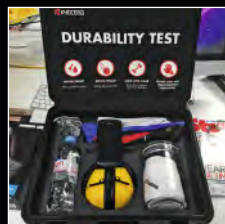
Inexpensive and indispensable, the original Mu folding USB charger was a designer's dream solution to the problem of the cumbersome UK three-pin plug. And now it's got some new skills. The Tablet version has a 2.4amp output, suitable for putting the wind up an iPad Air or such like. The Duo has twin 1.2amp USB sockets, while the original 1amp Mu, now called Classic, comes in new pink and blue versions as well as black and white. Meanwhile, on Indiegogo, the company has just smashed its target for a modular travel plug of a similar design.

£15, £20, £22 / themu.co.uk



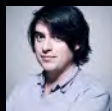
OUR MONTH

What the past 28 days have brought us by way of geekery



I TRIED TO SMASH A PHONE

Kyocera's so confident in its rugged Torque phone, it sent one to us with stones, water and a guide on how to use them as smartphone torture implements. We've dropped it and drowned it and so far the it's shrugged it off. Check *Stuff*.tv for the full review.



Tom Parsons
reviews editor /
phone abuser

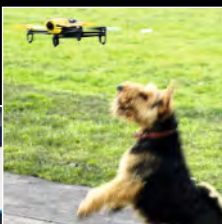


I VIRTUALLY SAT IN A CAR

A Skoda augmented reality pop-up at Waterloo station gave commuters 30 seconds of fame up on the advertising screens as their choice of car was built around them. I felt odd sitting in a huge virtual motor, gurning down at the crowds below. A good kind of odd.



Fraser Macdonald
consulting editor /
Czech film star

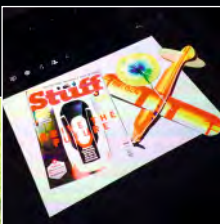


I MADE A NEW FRIEND...

...while flying Parrot's Bebop in a park. Immediately after taking off it was chased by a passing dog, who barked at the rapidly ascending drone until his owner dragged him away. You can read *Stuff*'s guide to drones starting on p44.

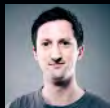


Tom Wiggins
deputy editor /
dog whisperer



I REDESIGNED STUFF...

...on HP's exciting new sci-fi PC. The Sprout lets you scan 2D and 3D objects then collage them with your fingers. Our art editor certainly has nothing to worry about, but I look forward to scanning and redesigning our team's heads when it arrives in April.



Mark Wilson
features editor /
collage student

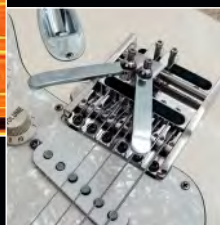


I STRUGGLED TO SAY THE NAME OF THIS GAME...

...even though I thoroughly enjoyed it. It's *Apotheon*, a Greek myth played in a *Metroidvania* style. It even looks like it's all been drawn onto the side of an old vase. The only problem is I couldn't tell anyone what I was playing.



Ross Presly
deputy art editor /
Greek god
of gaming



I MADE A PEDAL STEEL GUITAR, Y'ALL

Well, I converted an old Strat into a sort of pedal steel by fitting a Duesenberg Multibender bridge, so now I can 'bend' individual strings while playing slide. Take that, Chris bloody Rea.



Richard Purvis
production editor /
on the slide

T7 Bluetooth Speaker with Micro Matrix™ Or in layman's terms, it sounds great.

It has taken Bowers & Wilkins 50 years of acoustic knowhow to make the T7. And thanks to high-resolution streaming via Bluetooth aptX® and an incredible 18 hours battery life, you're guaranteed best-in-class performance wherever you are.



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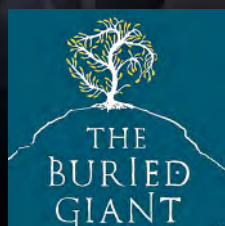
Free delivery

Bowers & Wilkins

CHAPTER

YOUR MONTH **MAR**

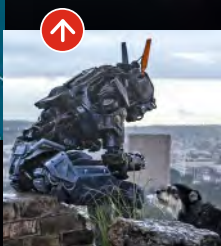
Time marches on, and so will March, so don't forget to put this lot in your diary...



03

THE BURIED GIANT

Kazuo Ishiguro
A departure for Ishiguro, of *Never Let Me Go* and *The Remains of the Day* fame. This novel is set in old England, in a time of knights, braggards and possibly dragons. If it's true to type, it's the characters that will make it ace.



06

CHAPPIE

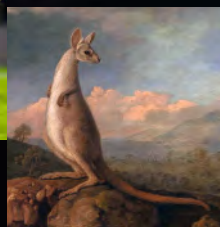
He of *District 9* and *Elysium* fame, Neill Blomkamp, is back with another cerebral sci-fi flick. This time: robots, not aliens. A nerdy ne'er-do-well nicks a police 'bot and reprograms it to think and learn like a child. What could possibly go wrong?



14

THE SIX NATIONS

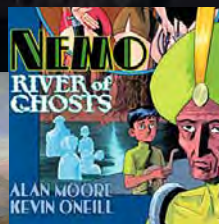
England v Scotland, Twickenham
Get ringside seats for this officially recognised post-Scottish-referendum gentlemen's smash-up! Get toggled up in fancy dress like it's the Sevens! Eat a pie! Tweet!



16

STRANGE CREATURES: THE ART OF UNKNOWN ANIMALS

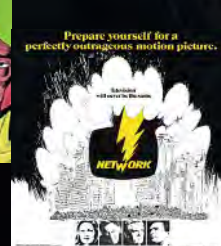
Grant Museum of Zoology, London
Before SD cards and Pinterest, the only way to share the wonders you'd seen on your travels was to draw. Which led, in some cases, to some pretty funny-looking animals.



19

NEMO: RIVER OF GHOSTS

Alan Moore & Kevin O'Neill
This is the third and last of the *Nemo* graphic novels — a spin-off from the *League Of Extraordinary Gentlemen* comics by Moore and O'Neill. None of which or whom are to be mentioned in the same paragraph as the 2003 film.



23

NETWORK

Blu-ray remaster
I want you to get up right now and go to the window. Stick your head out and yell: "I'm as mad as hell, and I won't take this any more!" Then shout: "I'm really pleased I bought this Blu-ray remaster of the film *Network*! It's really quotable!"

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Mu-so is our first wireless music system. Finely tuned by our specialist engineers in England, its powerful digital brain delivers the most exceptional quality in sound, commanding 450 watts of power through six custom-designed speakers, to create an experience of music that has to be heard to be believed.

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'I'm waiting for the latest phone'

'Until then, I'm keeping the phone I've got and going Vodafone SIM only. I get all my data, texts and minutes and I can upgrade whenever I want.'

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WIN



TOTAL
PRIZE
VALUE
£1097

WIN A PROGRAMMABLE 100-WATT STACK WITH BLACKSTAR AMPS

Being able to play a musical instrument is great, unless you're Jamie Cullum, in which case we'd really rather you didn't. But whether you're itching to thrash out some meaty power chords or just keen to unleash your inner cellist, here comes your big chance, because 21 March 2015 is Learn To Play Day, when over 100 UK music stores will be offering free taster lessons across a huge range of instruments. See learntoplayday.com for more details.

Now, did someone say meaty power chords? There's only one way to amplify that sort of thing, whether you're a guitar novice or a seasoned widdler – and that's with a proper, grandparent-scaring 100-Watter. Like the Blackstar ID:100TVP (RRP £399), a programmable head with six amp voices and 12 effects. Add one Blackstar ID:412 speaker cab (£349) for a giggable half-stack, or a pair of them for the classic full-stack experience. One lucky reader won't even have to pay for them...

HOW TO ENTER

For those about to rock, we salute you. But first, go to stuff.tv/win and answer this highly relevant question:

WHICH OF THE FOLLOWING IS NOT A BREED OF COW?

- A** ... Hereford
- B** ... Texas longhorn
- C** ... Yorkshire terrier

Find out more (about amps, not cows) at blackstaramps.com

Terms & conditions **1** Open to UK residents aged 18 or over. **2** Entries close 11.59pm, 8 April 2015. **3** Prize is as stated. **4** Prizes are non-transferable. **5** Only one entry per person. **6** For full Haymarket terms & conditions see www.stuff.tv/legal
Promoter: Haymarket Media Group, Teddington, Middx TW11 9BE

LEARN
TO PLAY
DAY

Saturday
March 21st
2015



HURRY!
COMPETITION
CLOSES
8 APRIL
2015

THE
ONE FOR
BEGINNERS



THE ONE
YOU CAN'T
LOSE

THE
TINY ONE



THE
ONE WITH
WINGS



HIGH SPEC SKY TECH

A swarm of new drones has gathered in the sky ready to take 2015 by storm – and filming in 4K is just one of their many skills...

[Words Tom Wiggins Pictures Matthew Beedle]

THE
ONE THAT
SHOOTS
4K



THE ONE
FOR THE
PROS



THE RULES OF THE SKY

1 WEIGHT A MINUTE
Unless you intend to fly a drone for commercial purposes, or it weighs over 20kg, you don't need permission from the CAA.

2 LINE OF SIGHT
Always keep your drone in line of sight, and no more than 500m horizontally and 122m vertically away from the pilot.

3 KEEP YOUR DISTANCE
Keep it 50m away from people, buildings or cars. If you're flying near large groups, make it 150m or get permission.

4 PRIVATE EYES
Be aware of privacy laws. Don't snoop in people's gardens and then publish the pics or video online, even if it's just on social media.

5 GET OFF MY LAND
Seems obvious but never fly one in restricted airspace, ie: near an airport. They don't like that one bit. Read the full rules at caa.co.uk/uas

THE ONE THAT SHOOTS 4K

DJI INSPIRE 1

from £2380 / dji.com / flyinggadgets.com

If you stand in front of a hovering Inspire 1, its four propellers buzzing like a swarm of hornets in an anger management class, it's impossible not to think of the scene in *Robocop* when ED-209 malfunctions and turns that poor chap inside-out with its mounted machine guns. Fortunately the Inspire 1 isn't armed, but if you don't know what you're doing, its 2935kg hull, 13in props and top speed of almost 50mph could do some damage.

However, it's a hugely capable drone, with a camera on a 3-axis gimbal that can shoot 4K video at 30fps, 1080p at 60fps and 12MP stills to an onboard micro SD card. After takeoff

the carbon fibre arms lift the propellers away from the camera's field of vision to give an unobstructed 360° view, while the live video feed can transmit to a paired phone or tablet up to 2km away.

The Inspire 1 comes with one controller but it's possible to add another and hand over the camera controls to a co-pilot while you concentrate on keeping the drone in the sky. It constantly keeps track of its own position to ensure stability in the air and remembers where it took off from, updating its home point if you move. It's like having the world's most advanced and obedient boomerang.

HANDS ON



JOOLS WHITEHORN
CONTRIBUTOR

From the moment you see it, it's obvious the Inspire 1 is no toy; it's sleek and sculpted, reminding me of a sentry turret robot from *Portal*. The controls are a mix of user-friendly automation and pro-level customisability. Swiping an on-screen slider triggers the auto-takeoff sequence, lifting the drone to around head height and smoothly raising its legs. Once aloft, there's an abundance of on-screen options within the app, as well as wheels and extra shoulder buttons on the controller for quick operation of camera settings. Like the smaller DJI Phantom series, the Inspire 1 is nimble and responsive, though its extra weight is obvious from the bassier prop noise and more purposeful movement. Its speed is impressive – essential for tracking shots of vehicles and fast flybys – and only slightly terrifying. It's not for casual flyers, but personally I can't wait to give it another go.

Flying webcam

The controller has a mount for your phone, with the free app giving a 720p live video feed or map view, and syncs footage to the phone's memory while you fly.





1

2

1

2

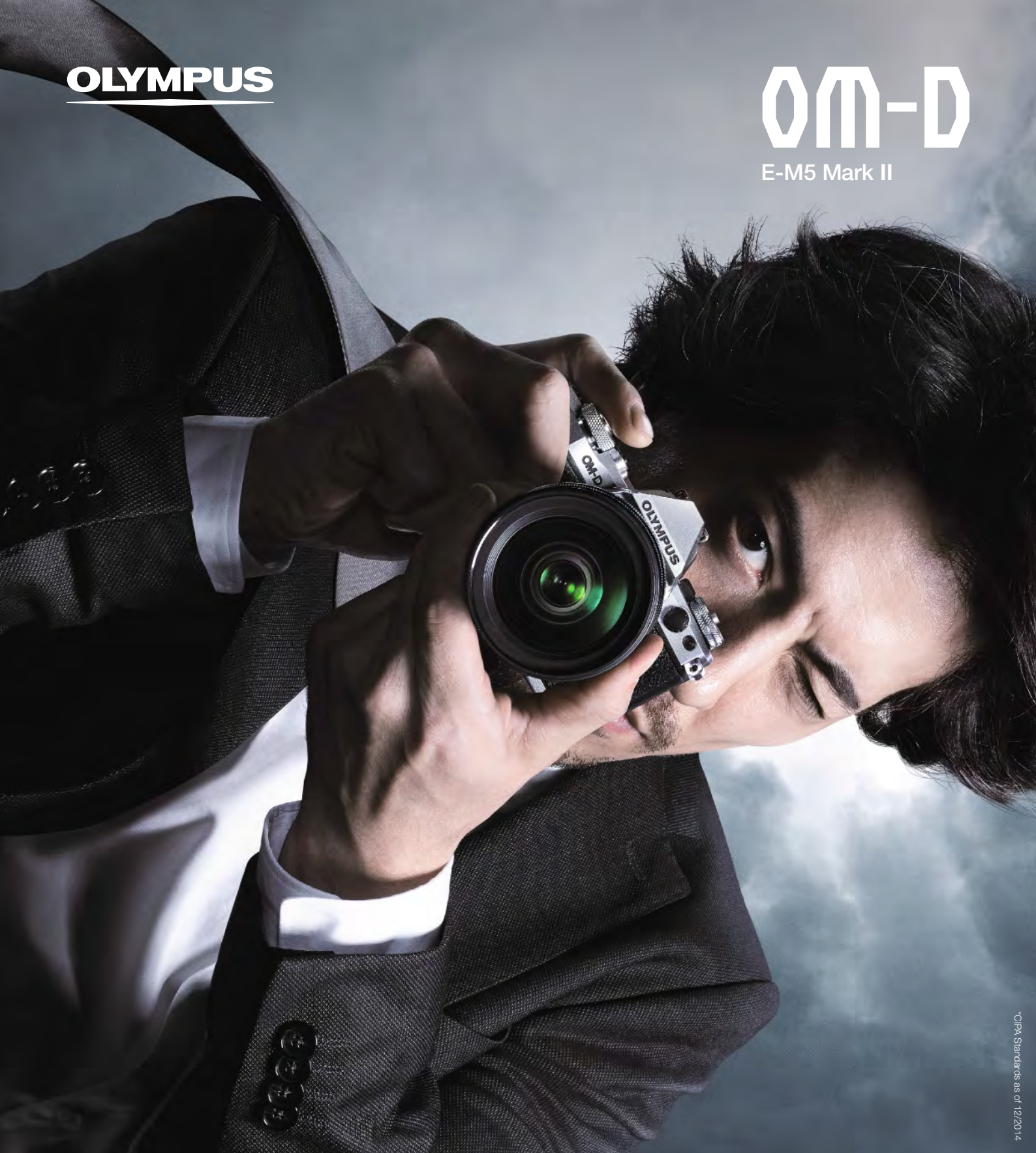
Hover the top
These sensors on the bottom use sonar and visual feedback to calculate its position in the air, allowing it to hover in place when GPS isn't available.

Ready, steady, go
The DJI's gimbal is constantly fed data about the drone's movement to ensure it keeps the camera steady, even if you're flying it like you stole it.

OLYMPUS

OM-D

E-M5 Mark II



*CIPA Standards as of 12/2014

YOU ARE FREE

Follow your creative visions with the new OM-D E-M5 Mark II. Capture spur-of-the-moment photos and movies in breathtakingly clear quality thanks to the world's most powerful 5-axis image stabilisation*. This OM-D is also ready to go wherever you go, in any situation. The compact build won't weigh you down, while the robust construction is set for taking on the elements: dust, splashes and freezing temperatures. Freedom has never felt so free – with the OLYMPUS OM-D.



Find out more at your local dealer or visit olympus.co.uk/omd



1

A clear head

The head where the camera is stashed can move independently of the rest of the drone, so it'll waggle in the wind without giving the pilot seasickness.

2

Props for the props

The eXom's four propellers are protected by these thin carbon fibre shields, although if the sensors do their job they shouldn't be needed.

THE ONE
FOR THE
PROS

SENSEFLY EXOM

£tba / sensefly.com

ANOTHER OPTION



DRAGANFLYER X6

Four propellers good, six propellers better, right? Yeah, that's probably why we're not allowed one of these. But if you are, it comes with a 20MP Sony QX100 which feeds video back to a touchscreen on the controller, with a separate display below it for real-time telemetry. **US\$9000 / draganfly.com**

If you're looking for a drone to fly around the local park, the Sensefly eXom is not for you. Despite its friendly, insectoid looks, this is a drone designed for professional mapping, inspection and suchlike, not terrorising the local shrubbery.

Rather than relying on GPS for navigation, the eXom is absolutely packed with sensors: five vision sensors that work a bit like those annoying parking beepers on your car, plus five ultrasonic proximity sensors, which all work together so the pilot can concentrate on what the HD camera's seeing rather than what it might be about to crash into. And it's not just

video and stills that the cam can record: there's a thermal mode too. It can even do all three at once. The eXom's eye has a huge 270° vertical field of view, meaning it can hover beneath things and inspect what's above.

Getting it to fly where you want is a case of either specifying a zone of interest on the eMotion app, or activating ScreenFly mode, which allows you to tap on an object from the camera's live feed and let the eXom fly itself into place.

But all of this comes at a price. What exactly that is hasn't been made clear, but to give you an idea, Sensefly's fixed-wing eBee drone (see p52) will set you back £15,000.

PRO TIPS



PHILIPPE FRANCKEN
FOUNDER OF
CITY DRONES LTD

ONE CHECK IT OUT

Have a good look over the aircraft to ensure there's no obvious damage, and repair or replace any parts before flying. If the unfortunate does happen, it'll help you pinpoint the origin of the failure.

TWO PRACTICE MAKES PERFECT

Slowly work out your drone's limitations. Set a goal and work towards it until it has been mastered; don't go straight into copying what you've seen on YouTube.

THREE DON'T BLAME IT ON THE WEATHER, MAN

It's not recommended to fly in any precipitation, bad visibility, winds over 10m/s or low temperatures. The colder it is, the less flying time you'll get out of the batteries.

FOUR PREPARE TO FAIL

Familiarise yourself with the failsafe mode as it may be your chance to rescue your aircraft. If you fly a lot, get public liability insurance. There are some specific UAV plans.

1

Google-beater

The Iris+ can take high-res top-down shots to make maps, or even capture the data required to create 3D models of buildings or landmarks.

2

Watch out

For more geek points, you can use a Pebble smartwatch to control the Iris+. Just sync it with DroidPlanner 2 and you can transfer all control to your wrist.



THE ONE
YOU CAN'T
LOSE

3D ROBOTICS IRIS+ PRO KIT

€1085 / shop.electronicshobby.com

While DJI's Inspire 1 is for seasoned pilots only, and Parrot's Bebop comes with aerial training wheels, 3D Robotics' Iris+ hovers somewhere in the middle. It has a slight Meccano look about it, but it's pretty much ready to fly as soon as you open the box.

This Pro Kit comes with a motorised gimbal that screws on underneath, although the cheaper basic model just has a fixed camera mount at the front. For footage that's steadier than a heavily sedated rock you'll want the gimbal. The Iris+ doesn't come with a camera, but it's designed to hold a GoPro Hero 3 (£150) or Hero 4 Black (£370, gopro.com) – with

the latter giving you 4K-quality video.

If it starts to run low on battery or strays out of range its built-in GPS will guide it back to where it took off from, but things really get good when you attach the bundled antenna to an Android phone or tablet, turning it into a touchscreen controller for the Iris+. A free app called DroidPlanner 2 allows you to draw routes on a satellite map for your drone to fly automatically, or you can put it in 3PV mode so it follows you – ideal for gnarly skiing or mountain-biking videos and high-altitude drone pics. It'll make using a selfie stick look positively understated.

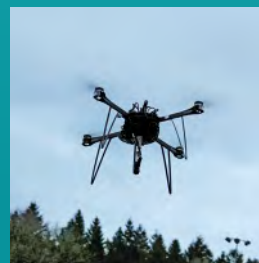


● THE ECO-DRONES

The Iris+ might not be able to take its eye off you, but BioCarbon Engineering's drones are more concerned with what's happening on the ground. That's not something you'd normally look for in a thing that's supposed to fly, but BE's objective is very much land-based. Deforestation destroys 26 billion trees a year and even the keenest, most green-fingered gardener would struggle to replace them at the same rate. And that's where the drones come in.

First the area to be replanted is mapped from the sky, then a specially adapted planting drone is sent around a pre-determined route to fire pre-germinated seed pods into the ground from around two metres up, at points identified from the maps by the BioCarbon Engineering team.

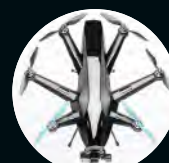
Does it work? Well, you'll have to wait a few years to see the results. Trees don't just spring up overnight, you know.



Control yourself

No, it's not an old-skool RC car controller – this is for the Iris+. It's great for intricate manoeuvres, but to unlock all of the drone's skills hook it up to your phone.

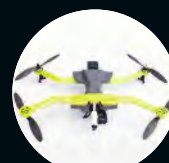
GOPROS
THAT GO
WHERE
YOU GO



HEXO+

The GoPro-carrying Hexo+ requires no extra antenna for your phone. Just use the app to choose, frame and order your shots, select camera movements and then edit the footage, before uploading straight to YouTube. It's like having a director in your pocket.

US\$1150 / hexoplus.com



AIRDOG

Man's best friend just got tougher with the AirDog, a GoPro-sliding drone that follows a wireless, waterproof AirLeash you wear on your wrist or attach to your bike. The AirLeash even lets you tweak some controls while flying.

US\$1300 / airdog.com

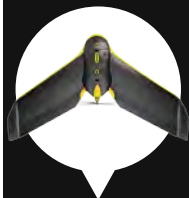
**MORE
FIXED-WINGS**



CARBON FLYER

Looking a lot like a paper aeroplane made out of carbon fibre instead of old trees, the Carbon Flyer is controlled via Bluetooth and is almost designed to crash. That doesn't mean it won't fly – it just won't mind too much when it inevitably makes an unscheduled landing.

**US\$150 /
carbonflyer.com**



SENSEFLY EBEE

The eXom's older sibling, this flying wing will also pilot itself, although the eMotion software allows you to adjust its flightpath, changing the altitude at specific points in order to capture more detailed info down low or avoid obstacles by flying high.

**£15,000 /
sensefly.com**

THE ONE
THAT'S
A WING

LEHMANN LA100

€1035 / lehmannaviation.com

With all these heli-drones it's easy to forget that the ones the military has been using for years are more often wing-based. Weighing in at 850g, with a 92cm wingspan, Lehmann Aviation's LA100 takes its cues from those, although without all the scary stuff. Simply attach your GoPro, fire up the prop and throw the LA100 into the air; it'll take it from there.

In fact, this is probably the only drone here that actually deserves the name, because once it's airborne you can kick back and watch it get on with the job. Or not – it doesn't matter. After it's left your hands you can't control the LA100 at all: no barrel rolls, no loop-the-loops,

nothing. It'll spend the next five minutes flying a pre-programmed route within a 500m radius of the launch site at an altitude of about 100m, before landing gracefully at your feet with its photographic payload. It can even land on water.

Obviously all this means you can't adjust the camera while it's in flight, or get it to buzz your brain tower for the world's most terrified-looking selfie, but it should make it pretty difficult to crash and it's one of the simplest methods of getting started in DIY aerial photography. If you'd prefer a bit more control, the LA200 (€2125) lets you plot a flightpath on a Windows 8 tablet.



**● SOME DRONES
YOU'D BE VERY
HAPPY TO SEE**

Most people might associate winged drones with nasty military business, but you don't have to look far to find them doing good. CATUAV, a company based in Barcelona, has developed a drone that can detect buried landmines using a combination of near-infrared, thermal and standard cameras. Someone still has to go in and dispose of the mines, but with over 70 countries still plagued by them, these maps help to take out some of the dangerous guesswork.

New Zealand's coastguard has been sending a UAV out ahead of the lifeboat in an attempt to speed up the process of finding people at sea. The drone, named Toroa, which is Maori for albatross, is also large enough to carry and drop liferafts and supplies when someone is located.



Mission control

There are no controls for the LA100 as it flies itself, but this is the OperationCenter app, which is used to draw flight paths for other Lehmann drones.



1

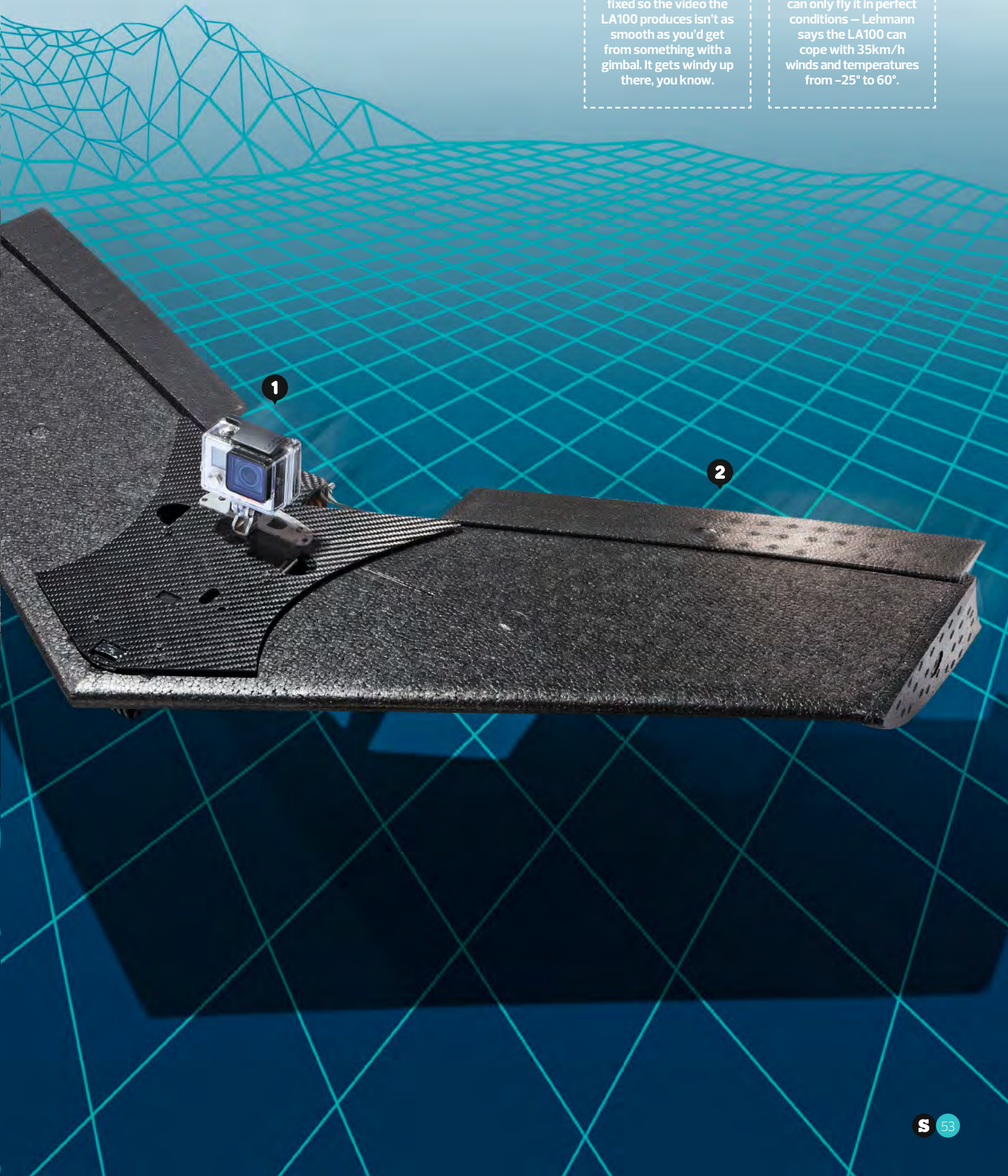
Turbulent video

The GoPro mount is fixed so the video the LA100 produces isn't as smooth as you'd get from something with a gimbal. It gets windy up there, you know.

2

Storm chaser

That doesn't mean you can only fly it in perfect conditions – Lehmann says the LA100 can cope with 35km/h winds and temperatures from -25° to 60°.





1

Points of view

The camera is built into the fuselage, but it has 'digital tilt control' for limited panning. It's not as good as a gimbal, but it does add up to a 180° field of view.

2

Bumper 'copter

For indoor flying the Bebop has guards that can be clipped on to stop its props coming into contact with stuff they shouldn't, such as your eyebrows, or the cat.

3

Your eyes in the sky

The Skycontroller adds an HDMI out, which can be used to pipe a drone's eye view to an Oculus Rift headset, complete with head-tracking camera control. Slick.

THE
ONE FOR
BEGINNERS

PARROT BEBOP

from £430 / parrot.com

Back in 2010, Parrot showed us the joy of flying cameras with its AR.Drone. It was more RC toy than full-on UAV but it was enough to give anyone who flew it the bug. The Bebop is its successor, and a significant upgrade.

You still control it with a phone or tablet but GPS is now built in rather than being an optional extra, so you can get it to 'return home' and hover above where it took off (not where it was built) before landing at the prod of a touchscreen, or plot flying routes on a map using Flight Plan mode, an in-app purchase for FreeFlight 3 (Efree, Android/iOS). The camera's been boosted to

14MP, plus it'll shoot 1080p video to its 8GB of storage.

If you'd like finer control over your Bebop you can add a Skycontroller (below), which will bump the total price up to £770. That's a lot of cash, but it adds proper physical joysticks, a whole load of tactile buttons and an antenna the size of a small table that boosts the range to 2km. When just using a tablet or phone you are restricted by the strength of its Wi-Fi connection to the drone.

It's not all straight-faced, though. The AR.Drone's playful side lives on in the Bebop, with impressive flips executed with one touch. No wonder dogs are so into it (see Hands On, right).

HANDS ON



TOM WIGGINS
DEPUTY EDITOR

On takeoff the Bebop immediately attracted the attention of a local dog, who stood underneath it and barked incessantly for the next few minutes. While we tried to manoeuvre it away from the hound's jaws, the Bebop also attracted the attention of a local tree. Its lightweight chassis was no match for the January wind and its emergency mode, which lands the drone automatically, is of no use when its propellers are tangled in branches. At least I'd proved that dogs can look up. Forty-five minutes and the help of a passing man called Yuli later, we managed to dislodge it. I decided to continue indoors.

The live feed is a little too laggy to navigate by and the on-screen controls aren't always as accurate as you'd like, but once you get the hang of it, swooping and strafing with the Bebop is brilliant fun. It's just a pity the battery runs out so quickly.

NEED MORE PRACTICE?



GHOST BASIC

Ghost used Indiegogo to fund two drones: the DJI-like Aerial and this simpler Basic model. Once in the air it's just a case of using the app's map view to direct it around the skies, a bit like playing your own airborne point 'n' click real-time strategy game. [US\\$600 / ghost-drone.com](http://US$600 / ghost-drone.com)



DJI PHANTOM 2 VISION+

The Inspire 1's little brother has a friendlier price tag and less daunting appearance, but it can still produce some incredible aerial footage from its onboard camera. It even knows the areas you're not allowed to fly in to prevent coming a cropper with the coppers. £940 / dji.com





1

Sky writing

This 8x8-pixel display allows you to show coloured icons in order to tell each drone apart, plus it also doubles as a countdown timer and flash for the camera.

2

Lens be friends

The Zano is meant for relative close-ups, not mapping or long shots, so it'll work best between 15 and 30 metres away from you. Say cheese!

THE TINY,
SWARMING
ONE

ZANO

£170 / flyzano.com

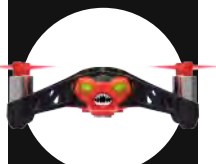
On its own, one tiny Zano drone might not be particularly intimidating, but just imagine a whole swarm of them stalking your every move. Backed by £2.3m of Kickstarter cash after asking for just £125,000, an individual Zano measures just 6.5x6.5cm, connects directly to your phone or tablet over Wi-Fi and takes to the air to film whatever gnarly pursuit you happen to be doing that day. But multiple Zanos can form a multi-angle, autonomous camera cloud, all shooting the same subject from different positions while tracking you at a speed of up to 25mph. Technically there's no maximum swarm size, although an upper limit

of 255 has been set for practical reasons. Just imagine trying to outrun that angry little lot.

Each Zano has an infrared sensor to communicate with its buddies and avoid obstacles, so they should be able to dodge trees and other riders as you barrel down single-track on your mountain bike with the swarm in tow. If you'd rather take control, a Free Flight mode brings up on-screen joysticks and sliders to allow you to play pilot.

Its camera shoots 5MP stills and 1080p video, plus there are plans to add face recognition and in-app editing to allow you to add filters, audio and text. Tiny, but mighty.

SMALLER



PARROT MINIDRONE ROLLING SPIDER

Parrot's palm-sized, angry-faced MiniDrone weighs just 55g, and its engines have a nifty trick of firing up when you drop it. The snaps from its downward-facing camera won't rival the Inspire 1 for quality, but then it does cost 30 times less than DJI's pride and joy.

£90 / parrot.com

EVEN
SMALLER



REVELL CONTROL PROTO QUAD

Revell isn't 100% sure but it reckons the Proto Quad could be the world's tiniest quadcopter. Small enough to sit on the controller with plenty of room to spare, it measures less than 3cm across, can do loops – and if you're not careful you'll lose it when you yawn.

£tba / revell.de/en

● DANGER ZONE RESCUE DRONE

The Zano might snap excellent selfies, but if you were trapped in a collapsed building and your phone had been crushed by what used to be an en-suite bathroom, adding to your Instagram account should be the last thing on your mind.

Flyability's Gimball drone, which recently won the UAE Drones For Good Award, is encased in a spherical cage that protects its propellers so it can reach its goal by bumping around hazardous environments, bouncing off obstacles like a motorised daddy-long-legs.

With an HD camera streaming video back to base, it can be used to search for survivors, inspect unsafe structures and look around areas with toxic atmospheres. Smart.





NEW LEICA T CAMERA SYSTEM LENSES

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NEXT

THE DRONE OF THE FUTURE

Think shooting 4K video and auto-following is smart? That's nothing compared to the drones that are on their way...



1

IT'LL FLY ITSELF

Automatically following a phone is all well and good but it's not quite autonomous flight, is it? AscTec's Firefly can find its way from A to B automatically, without bumping into any obstacles it encounters on the way, even if they move. It uses six Intel RealSense cameras that can detect objects in 360° around the drone and send avoidance commands to its autopilot system. San Francisco's Skydio has also created a similar system.

RIP drone pilots?
asctec.de



2

YOU'LL FLY IT FROM ANYWHERE

Unless you've managed to train an octopus to use a couple of joysticks, right now you need one pilot per drone you want to fly. If you've got a fleet of them, that soon gets complicated and potentially expensive, especially if they're not all in one place. However, DroneDeploy has developed cloud-based software to enable one person to pilot multiple drones — and because it works over 4G the pilot doesn't necessarily even have to leave the house.

dronedeploy.com



IT COULD SAVE YOUR LIFE

If you have a heart attack, getting help quickly can be the difference between life and death. Alec Momont of Delft University of Technology in the Netherlands has designed an autonomous drone that can deliver a defibrillator to a patient far quicker than an ambulance. It uses the caller's phone's GPS to locate the scene and has cameras and microphones onboard to allow medical staff to deliver potentially life-saving instructions to someone at the scene.

alecmomont.com



1

IT'LL PROTECT YOUR PRIVACY

If the sky ends up thick with drones there's a good chance they won't all be delivering medicine or innocently filming high-altitude home videos. If you suspect you might be a target for spies or paps, you might need a Rapere — a kind of autonomous flying guard dog. If you spot a suspect drone flying over your property, launch the Rapere and it'll scan the sky for the culprit, hover in position above it and drop a tangle line into its propellers.

rapere.io



6

THE DRONE OF THE FUTURE



5

IT'LL BUILD A HOUSE FOR YOU

OK, so a drone won't actually lay the bricks or paint the skirting boards for you, but Tokyo construction company Komatsu plans to use drones made by San Francisco start-up Skycatch to scan building sites from the air just like one of Sensefly's would, then use the resulting 3D models to program routes for driverless bulldozers. As they flatten and dig, onboard sensors will even collect data on how the land has changed in order to update the original 3D models.
skycatch.com



IT'LL DELIVER YOUR SHOPPING

Amazon's Prime Air drone might've been mostly a PR stunt but it's not just a copy of *Life Of Pi* in the sky. A company called Matternet is already using drones for test deliveries of medical supplies and blood samples in remote areas of Haiti, Papua New Guinea, Bhutan and the Dominican Republic, with plans for its own fleet this year. The real question is: can drones deliver those 'sorry we missed you' notes without bothering to knock as well as a living, breathing postie can?
matternet.us



7

IT WON'T LAST FOREVER

Most of the drones here are made of plastic and carbon fibre: great for withstanding collisions with trees or the ground but not the most eco-friendly materials in the world. NASA's Ames Research has come up with a 'living' bio drone that looks a bit like a flying eggbox. It's made from fungal tissue, so if it crashes out of recycling reach it just rots away into mushy goo. Great if you don't want it to be found, or are flying where it would be impossible to get back.
bit.ly/fungidrone



8

AND IT WON'T NECESSARILY FLY

We know more about the surface of the moon than the ocean floor, so why take to the skies? As part of the excellently named Silent Nemo project, the US Navy has made an underwater drone that looks like a five-foot shark. GhostSwimmer propels itself just like a real shark, making it quieter than anything with a propeller. It's designed for surveillance and reconnaissance at depths from 0.25-90 metres. The size of your boat should be just fine.
bit.ly/ghostswimmer



NEW

Want your own aerial adventure?



Parrot Bebop Drone with Skycontroller

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A fit of goggles

Samsung's Galaxy Note 4-based, Oculus-powered virtual reality headset is surprisingly slick and well-designed – but we're left wondering who would use it regularly

From £185 / samsung.com/uk

When Samsung announced it was releasing a set of virtual reality goggles, you could've been forgiven for thinking that here was just another example of the tech giant trying to beat rivals like Sony to the punch.

A gimmicky, ill-conceived and underpowered product would surely be the upshot. But a subsequent deal to use Oculus VR's technology and the company's own Galaxy Note 4 phone – with its huge 2560x1440 screen – as the headset's brain and display convinced us that Samsung was serious. A few months on, the Samsung Gear VR is here to prove our initial cynicism wrong.



1 No need for 20/20 vision

The dial on the top of the Gear VR allows you to adjust the lenses, moving them back and forth to compensate for short or longsightedness. It only works to a certain degree, and those with severe eye issues or one eye significantly worse than the other may have problems – contact lenses might be required.

2 Strap me in

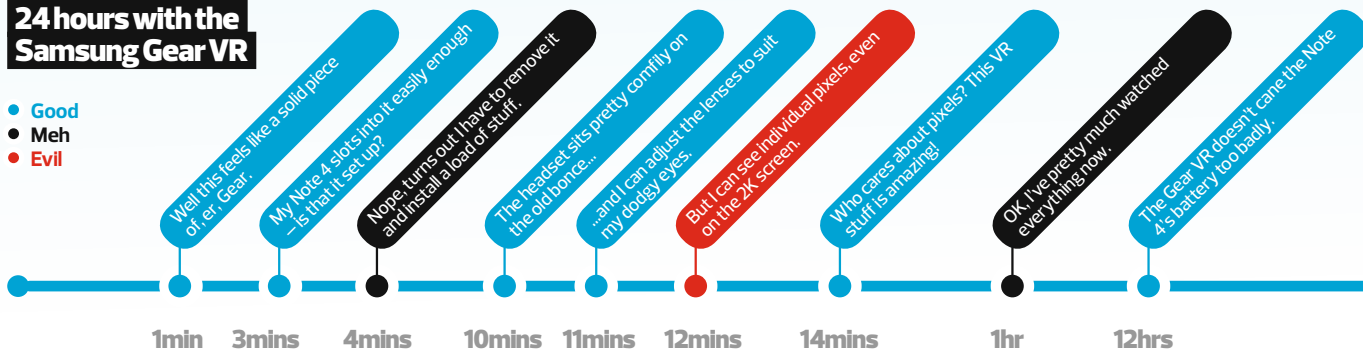
The straps are padded and adjustable, while the Gear VR's eyepieces are ringed with soft foam that not only cushions it against your face but shuts out exterior light. At only 379g and with no external cables required, it can be used anywhere. We don't recommend walking down the road with it on, mind.

3 The Note 4 is its brain

The Samsung's Galaxy Note 4 phablet is a vital part of the Gear VR setup – it runs the apps, pumps out the sound and of course delivers the 3D images. The Note 4's AMOLED screen is split down the middle, so each of your eyes sees a decent, pixel-heavy 1280x1440 picture.

24 hours with the Samsung Gear VR

- Good
- Meh
- Evil





4 VR heaven?

Even with all those pixels, the magnification of the eyepieces and the fact that the screen is so close to your face mean you can make out the 'screen door' effect of the pixel structure. But once the VR stuff gets going any concerns melt away – being 'inside' apps, games and videos proves itself a brilliantly immersive experience.

5 App's the way not to do it

At the moment there are only 35 apps, games and 'experiences' (mostly videos) for the Gear VR, all free via the Oculus Home app. While almost all are impressive from a tech standpoint, you'll quickly tire of them – they will leave you craving richer, deeper stuff. Casual and VR aren't the best bedfellows, given the latter's price.

Tech specs

Viewing angle 96°

Dimensions 198x116x90mm

Weight 379g

Connectivity Micro USB

Screen 5.7in 2560x1440 AMOLED
(via Samsung Galaxy Note 4)

Table of content

Transport yourself to space or the sea: here are the best things to watch and play on the Gear VR



■ Temple Run VR

You've probably played *Temple Run* on your smartphone – but never like this. Now you're inside the head of the tomb robber as he tries to outrun the monsters, and it's far more intense.



■ TheBluVR

Find yourself in the ocean depths in this educational demo. 3D graphics render the deep blue sea's various denizens in so-close-you-can-touch-them realism. Surprisingly relaxing.



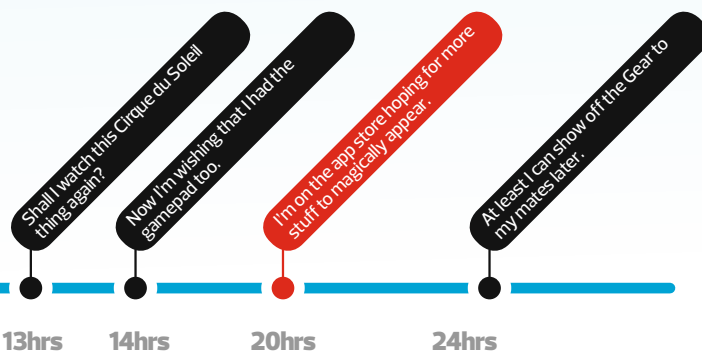
■ Oculus 360 Videos

A selection of clips filmed with special cameras that let you look anywhere, this is one of the first things you should watch on the Gear VR. The footage isn't that sharp, but it's still breathtaking.



■ Anshar Wars

A space combat game in which you move your head to steer a fighter and tap the touchpad to open fire, this is more involved than many other VR games; you'll need to spin a full 180° at times.



Samsung's slick headset reforges the Oculus's VR experience to suit a mobile device – and it works brilliantly. Trouble is, the demos and casual games don't hold your attention for long, and don't really suit the VR experience. The Gear VR's a fine proof of concept, but content is king; it needs more and it needs better. @samkiildsen

STUFF SAYS ★★★★★

It's user-friendly, but needs more apps to justify the price – at present it feels like a demo unit

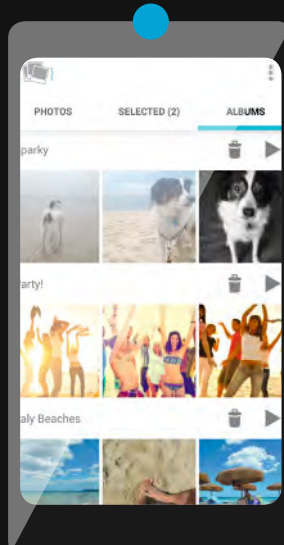
App:roved

FOR
PICTURE
PRIVACY

ShowStopper Photos

You pass your phone to a friend to show them an amusing photo, and they start scrolling. Before long, they've found those pics of you dressed as a My Little Pony and things are never quite the same again. This app blocks such shenanigans, enabling you to rapidly create standalone galleries on the fly. These can then be saved as albums for other 'scrollers'. You get four pics per album for free; unlimited scrollage costs 79p.

Stuff says ★★★★★
from Efree / Android, iOS

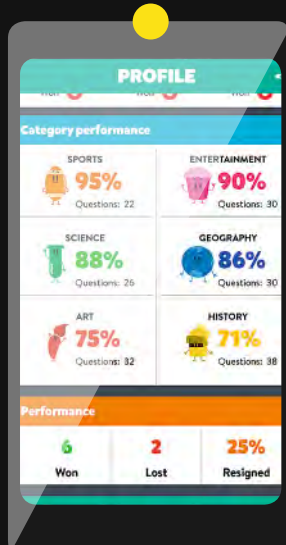


FOR
QUIZZING
MATES

Trivia Crack

Q1: What do you get if you cross Trivial Pursuit with Words With Friends? Answer: Trivia Crack. Q2: How similar is it to Trivial Pursuit? A: Very — the categories are identical. Q3: How's it work? A: You keep answering until you go wrong, at which point your opponent (a random or a friend) gets their go. Q4: Are the questions tough? A: They're set by other players, so vary from too easy to stupidly hard. Mostly the former.

Stuff says ★★★★★
Efree / Android, iOS, Windows Phone

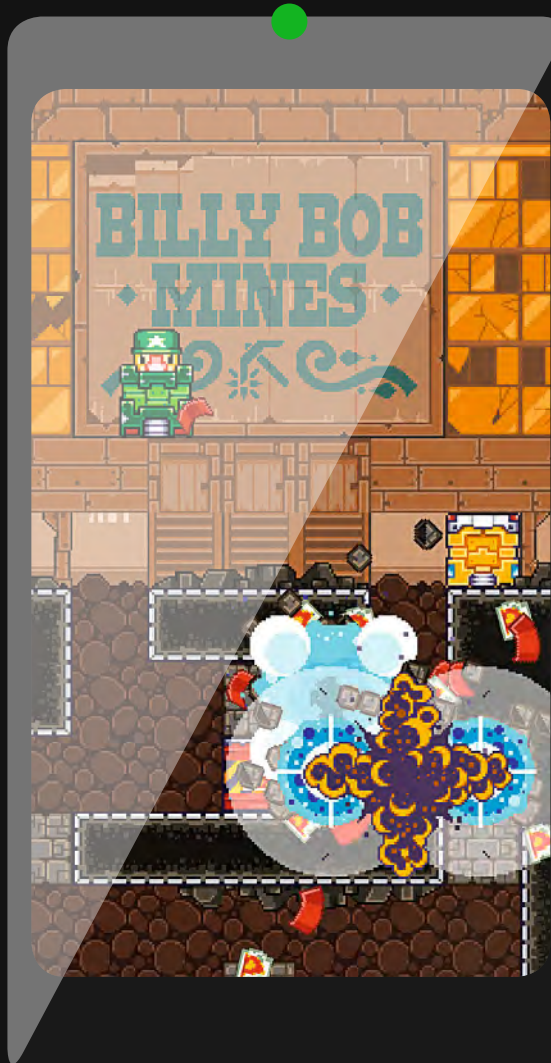


FOR
PUZZLING
ACTION

Gunbrick

Your task, as some kind of avian courier, is to pilot heavily armed metal cubes (known as Gunbricks) and blaze your way through an obstacle course with scant regard for health and safety. Given the potential for frustration, Gunbrick only occasionally outstays its welcome, with a combination arcade/puzzle section that's a bit too testing for the controls. But this is an original, zany and bold game, and a mash-up of genres that really works.

Stuff says ★★★★★
from E2 / Android, iOS



FOR
SNAPPY
VIDEOS

Replay

Designed for Instagrammers, but suitable for anyone with pics and videos sloshing about on their iOS device, Replay is about creating videos... fast. You make a selection, pick a theme and — BAM! — a masterpiece. You can make a few tweaks: style, pace, font, filters and cuts. For the most part, though, this is all about letting an app take the strain, turning a pile of photos into a promo, or baby videos into something guaranteed to make everyone blub.

Stuff says ★★★★★
Efree / iOS





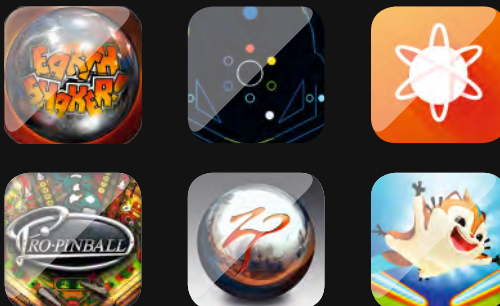
● Pinball Arcade

This hugely ambitious project recreates classic pinball tables inside your device, from relatively basic 1980s releases like *Black Knight* through to insanely complex modern tables like Stern's superb 2004 *Ripley's Believe It Or Not!* You can demo every table before you buy. Our advice: prepare your wallet for a workout.

Stuff says ★★★★★

£free / Android, £0.79 / iOS

Mini meme



VIRTUAL PINBALL WIZARD

Pinball's not just about randomly smacking metal balls about. The best tables have deep gameplay mechanics... and many of them are on mobile

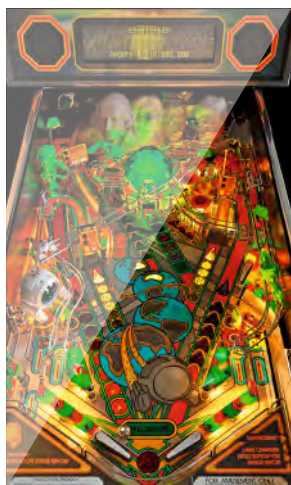


● Atomic Pinball Collection

This newcomer only has two tables for now, but they're both great, with perfect physics and large, vibrant graphics that look fantastic on an iPad. In *Revenge Of The Rob-O-Bot* you take on a furious android, and the madcap and fast-paced *Masks Of Glory* has you building tacos in a Mexican wrestling ring.

Stuff says ★★★★★

£2.29 per table / iOS



● Pro Pinball

Quite a few retro PC pinball titles have made their way to mobile, but Pro Pinball's the one we've been waiting for. The late-'90s series was epic, and *Timeshock!* doesn't disappoint on the iPad, with gorgeous visuals and challenging missions. Here's hoping *Big Race USA*, *The Web* and *Fantastic Journey* arrive shortly.

Stuff says ★★★★★

£2.49 / iOS (Android soon)

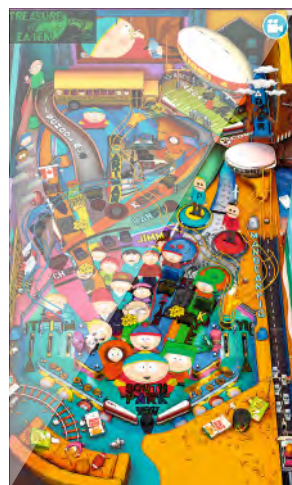


● Vector Pinball

You might argue that this shouldn't be here because it isn't a 'real' pinball game, but there's something beguiling about the way it strips things to the bone. Visually it's akin to a 1980s vector arcade title, and all the typical pinball sound effects have been replaced by musical tones that complement the soundtrack perfectly.

Stuff says ★★★★★

£free / Android

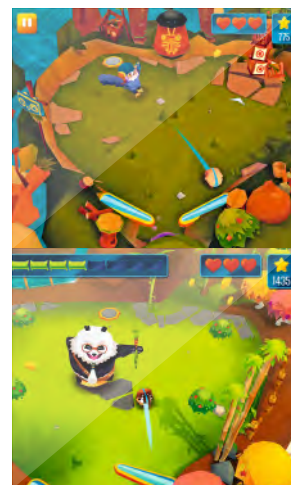


● Zen Pinball

Zen reimagines traditional pinball as freed from the confines of pesky reality, and then adds licensed bits. You still get flippers, ramps and switches aplenty but, depending on the table, may find yourself in a face-off against an angry Darth Vader, protecting X-Men from Sentinels, or zooming about South Park with Cartman and the gang.

Stuff says ★★★★★

£free / Android, iOS



● Momonga Pinball Adventures

We're a bit suspicious when developers attempt to merge pinball mechanics and arcade fare, but *Momonga* works. You blat a squirrel about, fighting the forces of evil. Everything barrels along, making the experience brief, but there's plenty of repeat play on offer if you're determined to three-star every scene.

Stuff says ★★★★★

from £0.89 / Android, iOS



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THE TOWERS OF TECH

We've come a long way from mud huts and mammoth-bone tents. Amy Frearson discovers the futuristic buildings that think they're giant gadgets

THE ECO WARRIORS

One Central Park
Sydney, Australia /
centralparksydney.com

What's the story?

This twin-tower skyscraper by French architect Jean Nouvel is equipped with a heliostat system – a huge panel of motorised mirrors that track sunlight and reflect it into a street that would otherwise be in permanent shadow. It also boasts a remote-controlled irrigation system that allows over 1000 species of plants to grow without soil across the building's walls.

FACT!

When the sun goes down, the suspended mirrors transform into a canvas for an impressive LED light show by the renowned artist Yann Kersalé.

THE ECO WARRIORS



▲ **Agora Garden**

Taipei, Taiwan (due 2016) / vincent.callebaut.org

What's the story?

This twisted 20-storey marvel now under construction in Taiwan's capital could be mistaken for a giant DNA strand. The double-helix construction isn't just for show, though. It creates a cascade of balconies covered in vegetable gardens and fruit trees, so residents will be able to grow their own food and compost their waste.

Fact! A 1000m² pergola of photovoltaic panels on the roof will generate enough energy to make it entirely self-sufficient.

▶ **ZEB Pilot House**

Larvik, Norway / snohetta.com

What's the story?

This house by architectural superstars Snøhetta not only generates enough electricity for itself – it has enough left over to fuel an electric car all year round. Its sloping roof is covered with solar panels and collectors that draw as much energy from the sun as possible, while energy wells in the ground supplement this with geothermal power.

Fact! The building is so well insulated that two radiators – one on each floor – are enough to heat every room.

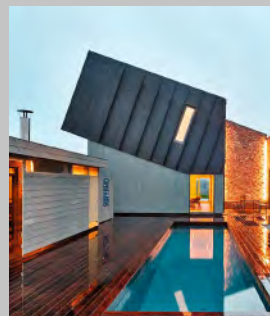
▼ **Italy Pavilion, Expo 2015**

Milan, Italy (due May 2015) / expo2015.org

What's the story?

Italy's national pavilion at the upcoming Milan Expo has been designed by Italian studio Nemesis & Partners to clean the air around it, thanks to the smog-purifying cement covering its exterior. Made from recycled aggregates, including scraps of Carrara marble, the material can transform airborne pollutants into harmless salts.

Fact! Over three quarters of the special air-purifying cement is itself made from recycled materials.



[Picture Bruce Damonte]



◀ **LEAPrus 3912**

Caucasus, Russia / caucasus.ru

What's the story?

With an altitude of 5642m, the dormant volcano Mount

Elbrus is Europe's highest peak, but that didn't stop Italian studio LEAPfactory building a hotel on top of it. The vertiginous building is made up of four resin and fibreglass tubes, which were prefabricated in a factory

before being airlifted to the site in pieces.

Fact! Forget having to harvest rainwater – this hotel melts some of the surrounding snow to provide water for flushing toilets.

THE SURVIVALISTS

Halley VI Research Station

Brunt Ice Shelf, Antarctica
/ hbarchitects.co.uk

What's the story?

Imagine an environment where temperatures drop to as low as -56°C , the sun doesn't rise for three months, and the icy ground below you can crack at any time. British architect Hugh Broughton was tasked with creating a building where at least 16 scientists can endure these conditions all year round. His response? A chain of heavy-duty modules that use hydraulic legs to climb up out of the snow.



FACT!

As the ice shelf floats out towards the ocean, the modules can be lowered onto giant steel skis and towed by bulldozers to a safer inland location.

Amphibious House

Buckinghamshire, England
/ bacahomes.co.uk

What's the story? What do you do if you live on a flood

plain? When you're not cringing at building insurance quotes, you build a house that floats. This timber-framed structure by Baca Architects sits inside an excavated 'wet dock' that allows it to rise up like a boat during extreme

flooding, guided by four vertical posts.

Fact! The tiered garden gives an early warning – once the first two terraces begin to fill up, they can expect the house to start moving.



THE TECH ICONS

Spaceport America

New Mexico, USA
/ spaceportamerica.com

What's the story?

The world's first commercial spaceport, this is the departure lounge for space tourists. For added drama, the astronaut areas are integrated with the terminal and voyagers can even take a peek inside the control room. Behind the scenes, tubes boring down into the earth reduce the building's heating, ventilation and air-conditioning costs by as much as 70%.

FACT!

Designed around the dimensions of Virgin Galactic spacecraft, the hangar can support two WhiteKnightTwo and five SpaceShipTwo vehicles.



Lucas Museum Of Narrative Art

Chicago, USA (due 2018)
/ lucasmuseum.org

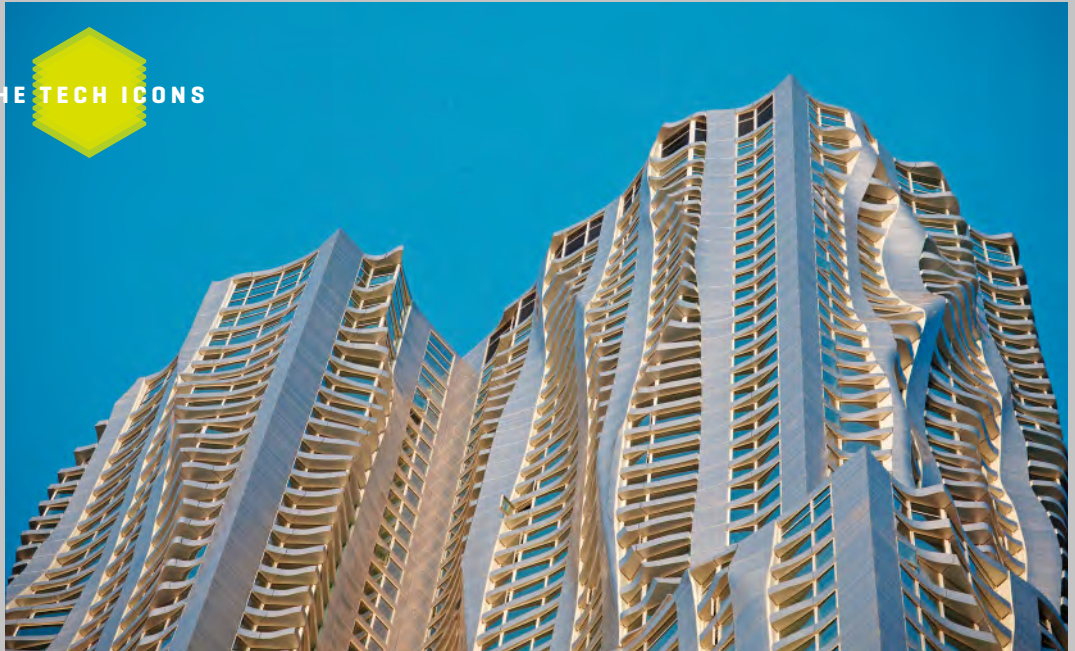
What's the story? It seems fitting that Ma Yansong's

design for a museum for director George Lucas wouldn't look out of place in a *Star Wars* movie. Proposed for Chicago's lakefront, the mountain-like structure will present a history of the moving image across three

exhibition spaces that will form 'infinite loops'.

Fact! Yansong plans to develop the design using 5D digital modelling, which calculates construction time and costs as well as form.

THE TECH ICONS

◀ **Sharifi-Ha House**Tehran, Iran
/ nextoffice.ir

What's the story? Neither sticky hot summers nor snowy winters present a problem to this residence by Tehran studio Next Office, which features three rooms that can be rotated by 90°. In warmer months, each swivelling pod folds out to reveal large windows and balconies, but when the temperature drops they're all brought back flat for residents to stay warm and cosy.

Fact! The pods' motorised turntables use the same system found in theatre sets and car exhibitions.

▼ **3D Print Canal House**Amsterdam, Holland /
3dprintcanalhouse.com

What's the story? In March 2014, DUS architects started a three-year project to print a Dutch canal house. In the process, they hope to discover the materials and methods that will help 3D-printed housebuilding become the standard for environmentally friendly architecture. The concrete-reinforced plastic blocks are being spat out by a 'Room Maker' as we speak.

Fact! You can visit and, for a €2.50 entrance fee, get a downloadable audio tour for your smartphone.

▲ **New York by Gehry**New York City, USA /
newyorkbygehr.com

What's the story? With its rippled steel facade, this skyscraper is the poster child for software that architect Frank Gehry believes will make paper redundant in architecture. Despite the form, which gives all of its 903 apartments a different profile, almost no printed drawings were required – all thanks to a cloud-based system that allows architects and engineers to share digital files and blueprints.

Fact! There are typically thousands of 'change orders' on builds of this scale. This had just eight.

▶ **Apple Campus 2**
Cupertino, USA (due 2016)
/ apple.com

What's the story? This US\$5 billion office is where

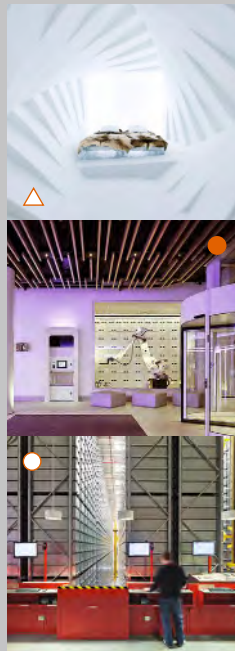
Apple will dream up the successors to its Watch, Macs and iThings. Most of the building's electricity will be generated by an onsite power plant boasting a bigger solar array than any other corporate HQ in the world, and

over three quarters of the site will be made up of distinctly non-techy greenery.

Fact! The subterranean car park will be fitted with over 300 charging points for electric cars.



THE INTERIOR TECHORATORS



[Pictures Mark Herboth, Paulina Holmgren]

▲ Multi elevator system (concept) thyssenkrupp.com

What's the story?
Moving sideways as well as up and down, this lift brings Willy Wonka's glass elevator one step closer to reality. Doing away with the traditional rope and counterweight, this will be controlled by powerful magnets that will allow several cabins to levitate in one shaft. The company plans to have a working prototype installed by the end of 2016.

Fact! With lifts travelling at five metres per second, you'd never have to wait more than 30 seconds for one to arrive.

▲ Art Suite: 7.5° Rø, Icehotel Jukkasjärvi, Sweden / icehotel.se

What's the story?
Every year the Icehotel commissions 15 artists to hand-carve 'art suites' for its winter season. This one, inspired by Danish astronomer Ole Christensen Rømer, stacks up blocks of ice to create a vortex and the illusion of infinity. It'll be open until April, after which the walls will melt and it'll be time to design a new one. Well, it's easier than stripping wallpaper.

Fact! This year's hotel was built from 30,000 tonnes of 'snice' – a mixture of snow and ice sourced from the nearby Tornu River.

● Yotel New York New York City, USA / yotelnewyork.com

What's the story?
A robot concierge greets you as you arrive at this Times Square hotel. The 'Yobot' takes care of your luggage, while you check yourself in at a digital kiosk. Once you've made it to your room, you can tilt or rotate your circular bed for sleeping, working on your laptop, or just slowly spinning around as you view the Manhattan skyline and boring hotels with non-spinning beds.

Fact! When there aren't any jobs to do, Yobot will perform acrobatics to entertain guests (and taunt hotel porters).

○ James B Hunt Jr Library North Carolina, USA / ncsu.edu

What's the story?
Library bookshelves might have their musty charm, but they're also an inefficient use of space. That's why the North Carolina State University built a robotic retrieval system, which lets you choose from over two million books and get them robo-fetched. The university also boasts a 3D-printing workshop, interactive walls and a dedicated gaming lab.

Fact! The bookBot system takes up five storeys, compared with the old system of 45 for the same number of books.



◀ London Cityscape £750 / chiselandmouse.com

Model houses? Pathetic. A true megalomaniac settles for nothing less than a framed plaster cityscape. This modelling company is currently taking orders for London's skyline. They'll even make a model of your house if you ask nicely (and pay them £1000).



▶ Scottish Tenement Kit £21.50 / finchandfouracre.co.uk

Not everyone wants to build the Guggenheim or the Eiffel Tower. For something a little more humble, try this card-and-glue tenement block. It comes with all the equipment you need to build a red or blonde sandstone abode for your tiny Victorian workers.

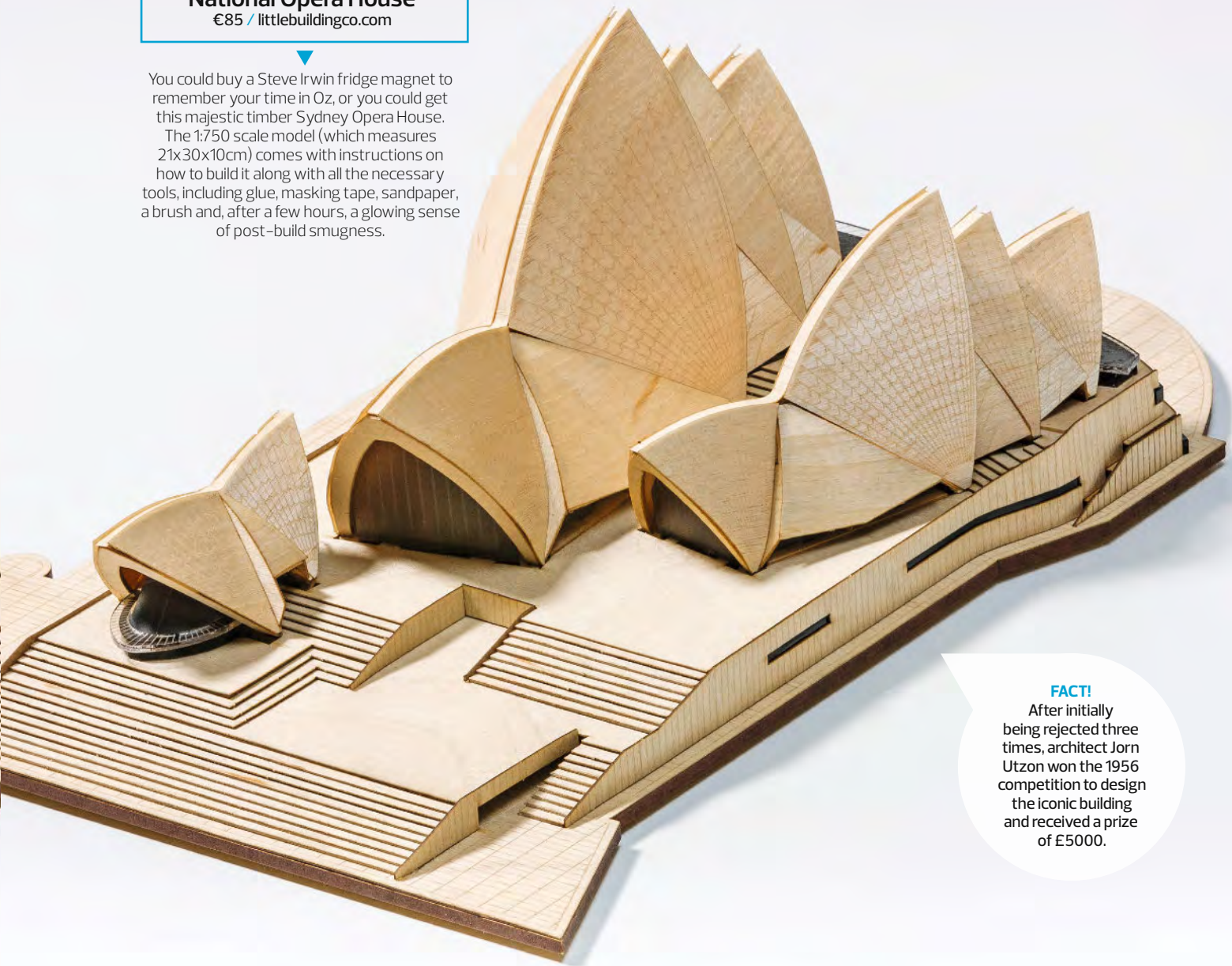
GREATEST KITS

Why should architects have all the tower-building fun?
Here are the world's best constructions for the rest of us

National Opera House €85 / littlebuildingco.com

You could buy a Steve Irwin fridge magnet to remember your time in Oz, or you could get this majestic timber Sydney Opera House.

The 1:750 scale model (which measures 21x30x10cm) comes with instructions on how to build it along with all the necessary tools, including glue, masking tape, sandpaper, a brush and, after a few hours, a glowing sense of post-build smugness.



FACT!

After initially being rejected three times, architect Jørn Utzon won the 1956 competition to design the iconic building and received a prize of £5000.



Arckit from £90 / arckit.com

Hate following instructions? This modular kit, originally designed for architects, lets you construct the house of your dreams, then knock it down and start again. It comes in three sizes and includes adhesive sheets to print off in different textures for added realism.



PopUpHouse £90+ / popup-house.com

Incredibly, the only tool you need to assemble this full-size earth-friendly abode is a screwdriver. It uses wooden screws, insulated blocks and laminate veneer lumber to create a recyclable, energy-efficient and customisable structure. Quite a project for Lego fans.

That special thumb thing

With better graphics and controller support, your iThing has designs on your games console. But which pad will make your 'Pad glad?



BEST FOR...
iPAD

SteelSeries Stratus XL

£60 / steelseries.com

First look

The Stratus XL has a premium finish and feels solid and hefty in the hand. Some sloppy button lettering lets it down a touch, but that's the most minor of minor niggles.

It's powered by two AA batteries, which last for around 40 hours. Some might baulk at the lack of an internal battery, but you can always use rechargeables.

Play time

The Stratus XL's PlayStation-like stick set-up might put off some gamers, but the controls mostly work well and enable subtle movement in shooting games.

However, the L2/R2 triggers aren't so successful. Their springs boast the strength of cotton wool; rest your fingers on them and there's a good chance your avatar will skid off the road. The controller also lacks an iPhone clip, but nonetheless, those gripes don't stop the Stratus XL being a worthy winner of this round-up.

STUFF SAYS ★★★★★

A robust, premium gaming controller that feels good and handles nicely in play



BEST FOR...
VALUE

Mad Catz Micro C.T.R.L.i

£40 / madcatz.com

First look

Fortunately, first impressions don't count for everything. The Micro C.T.R.L.i is disconcertingly light and feels a bit cheap; our review unit even had a slight rattle when shaken. You stuff an AAA battery into each arm, giving the unit an odd weight distribution. Yet for a smaller controller, it has plenty to offer.

Play time

The D-pad is surprisingly pleasing, and although the analogue sticks are a bit jerky they're better than those on its larger non-Micro sibling. Despite its size, the Micro only becomes slightly cramp-inducing during long sessions and includes a clip for holding an iPhone. But it 'snaps' on to the controller, so we imagine that won't last long before snapping in a different manner.

As a controller for iPad use it's a success, though – and at £20 cheaper than its rivals, great value for money.

STUFF SAYS ★★★★★

A solid option if you're looking for a smaller controller, and it's excellent value to boot



BEST FOR...
iPHONE

Moga Rebel

£60 / mogaanywhere.com

First look

Moga's Ace Power was the first iOS controller to market, but it was horrible, with an awkward case-style setup, rubbish buttons and unresponsive sticks. The Rebel is much better, and although its approach now clearly apes traditional console controllers, it still enables you to wedge an iPhone in a flip-up clip.

Play time

Unlike the Stratus XL, the Rebel requires charging. This can take hours, but plug the thing in overnight and it'll last for ages.

When it comes to playing games, the Rebel can be hit and miss. The D-pad is poor and prone to slippage, and we found the body a bit uncomfortable during extended use. However, the buttons are good, the triggers are more solid than those on the Stratus XL, and the sticks are close. For gamers who absolutely must clip in an iPhone, the Rebel's the best bet.

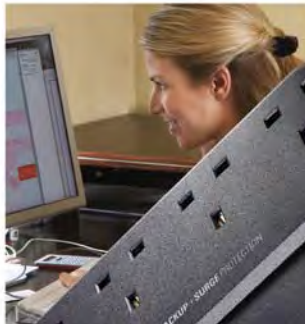
STUFF SAYS ★★★☆☆

A bit of a mixed bag, but it's the best option for those who want to clip in an iPhone



[Words Craig Grannell]

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Keep your electronics up and your energy use down!

ES Series

The ever-popular ES models are priced affordably yet provide enough extended runtime to allow you to work through short and medium power outages. Some power-saving models have been designed to actively reduce energy costs.

The energy-efficient ES Series

The new ES boasts innovative power-saving outlets, which automatically shut off power to unused devices when your electronics are turned off or asleep, eliminating wasteful electricity drains.

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STUFF PICKS CLEVER WATCHES

You can only deal with hearing so many
“What time is it?” “Time to get a watch”
dad jokes... so we're here to help

[Pictures Pete Gardner]



Breva Génie 03 Speedmeter

Will Dunn, editor

£35,145 / breva-watch.com

Don't worry, this isn't one of those watch guides that other, less brilliant magazines do, in which they're all so hilariously expensive they make London house prices look sensible. My colleagues have chosen some stunning watches that offer great value. On the other hand, I have chosen one that costs about the same as a year at Eton.

That said, it is the only watch in the world to have a built-in airspeed instrument. Press a button on the crown and an anemometer mechanism pops up and gives you a reading via the needle on top. Perfect for checking how fast your yacht, polo horse or sedan chair is going.



My watch... Seiko Kinetic SKX031K

It would take me 83 years to save up for a Breva, so I'll stick to Seiko for now. Self-winding and indestructible, it's twice been mistaken for a Rolex Submariner by airport security.



Just not wacky enough for you? Brevé's other watches include such steampunk frippery as a Lilliputian barometer-based weather station and an altimeter the size of a mouse's pancreas. Get out the piggy bank.



The Sistem51's 90-hour power reserve is noteworthy: many stratospherically expensive automatics with complicated mechanisms can only manage a day or so of being stationary before they wind down again.



Swatch Sistem51

Fraser Macdonald, consulting editor
£110 / shop.swatch.com

Isn't there a statistic about a handful of sand earning more money than the world's population put together? Something like that. Suffice to say, tiny beautiful things are in abundance; and when the big horrible things of the world get me down, it's frequently the watch industry I look to. Its sole mission: to find more and more complex ways to tell the time, using minuscule jewel bearings or hypercube tourbillons. But Swatch has managed to make a full-automatic mechanical watch with a 90-hour power reserve that uses only 51 parts. It even has a proper see-through back so you can stare at the movement's endless oscillations and forget about the world at large.



My watch...

Citizen Promaster Eco-Drive Tough

This solar-powered titanium monocoque is super-legible, light and waterproof. It used to be a rare Japanese model, but it's been reissued with 'Royal Marines' branding.

My watch...**Ball Engineer
Master II Aviator GMT**

The red hand tells me what the time is in Honolulu (it's adjustable), the radioactive Tritium-filled markings light my path home, and there's a train carved into its back.

**Montblanc
Timewalker
e-Strap**

Will Findlater, editor-in-chief
£3660 / montblanc.com

If there's one thing preventing me buying a smartwatch, it's my own shallowness. To be fair, you'd struggle to convince any wrist clock enthusiast to ditch a beautifully engineered future heirloom for a little LCD screen on a silicone strap. Montblanc's e-Strap sidesteps the issue by building smart functionality into the bracelet of a proper mechanical watch, and in this Timewalker Urban Speed's case, a racy 43mm chronograph at that. The e-Strap tracks your activity, syncing with and delivering notifications from iOS or Android, and can be easily swapped when the tech moves on.



+491783654-89



The touchscreen-controlled e-Strap also acts as a remote for your phone's camera and can sound an alarm on your mobile if you've misplaced it (or vice versa). Battery life is a claimed five days.



Realistically, the analogue hands on the GBA-400 are a bit tricky to read against the similarly metallic bits in the middle of the face. Not to worry, short-sighted people: there's a back-up digital display as well



Casio G-Shock GBA-400

Jools Whitehorn, contributor
£180 / watchshop.com

The GBA-400 stands on the chiselled shoulders of 30 years of G-Shocks, oozing ruggedness with a helping of Japanese robo-stylings. My dad had one of the earliest ones for diving, and I've been ensnared by its rough-and-tumble promise ever since. I want a watch that I can treasure while also not giving it a second thought. The GBA-400 also acts as a Bluetooth remote for music; seeing its mechanical connection indicator rotate from 'off' to 'on' makes me happier than I care to admit. And then there's the Phone Finder function that sets off a helpful noise on your phone. Now that's my kind of smartwatch.

My watch...

Other people's

As previous timepieces have proved too delicate for my careless ways, I scavenge time like a horological Bear Grylls: reading it off others' wrists, microwaves and occasionally even real clocks.



My watch...**LG G Watch R**

Screw smartphone timekeeping, I'm a fan of traditional watches. I am currently using a smartwatch, but there's something about Swiss movements that makes me feel all funny inside.

8

LG G Watch R

"Yes"

"No"



The Bradley's stealth timekeeping skills come in handy at the cinema when you realise the three-hour epic was a poor choice. They're also good for convincing my younger cousins that I can guess the exact time with my eyes shut.

Bradley Classic Steel Mesh

Esat Dedezade, staff writer
£175 / dezeenwatchstore.com



Watch hands have officially been banished to the annals of timekeeping tech, along with sundials and guesswork. It's all about ball bearings and magnets these days, you see. Apart from being a gorgeous chunk of minimalist industrial design, the solid stainless steel Bradley watch also lets me check the time in pitch black darkness, without emitting any light whatsoever. Originally developed for blind people, the Bradley's in-built magnets precisely control the rotation of two ball bearings, which represent the hours and minutes. Once you get used to their locations, you can tell the time in an instant.



The F100's Eco-Drive movement is charged by light entering the centre of the dial and hitting photovoltaic cells. Handily, a power indicator tells you both how much charge is left and the quality of your current light.



Citizen Satellite Wave F100

Mark Wilson, features editor
£1095 / citizenwatch.com

I like my watches to be understated with hidden talents – on the Colin scale, more Firth than Farrell. That's why the F100 is my dream timepiece. Its slim titanium case and minimalist dial don't shout 'super-techy satellite watch', but that's what it is. Unlike smartwatches, all its features are genuinely useful too. It instantly adjusts to local time in over 40 time zones, the secret solar panel keeps it charged for months and the perpetual calendar and quartz movement give it a 'set and forget' simplicity. Maybe the hands didn't need separate motors, but it ensures it has faster fists than Manny Pacquiao.



My watch... Garmin Forerunner 620

I'm a fan of slim watches that can talk to satellites. This is one of those rare beasts, a GPS sports tracker. I don't always wear it, but when I do, I usually have a very red face.

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www.stuff.tv

Sage by Heston Blumenthal Barista Express

Price £550 / houseoffraser.co.uk

BEST FOR...
COFFEE
ADDICTS

What's the story?

With the look of a shrink-rayed professional espresso machine, the grinning fizzog of shaven-headed culinary chemist Heston Blumenthal on the box and a price tag that puts it out of reach of all but the most well-heeled caffeine fiends, this is clearly aimed at those seeking a major step up in their home-brewed coffee.

Is it any good?

It's a lovely-looking all-metal thing with clever little touches: on top is a tray that warms your cups, and the 2L water tank has an integrated, changeable filter.

It also features a built-in grinder, allowing you to make coffee with beans you've smashed into dust just seconds earlier. Freshness means a lot in the coffee world, so this is a big deal, as is the low-pressure pre-infusion of the grounds before

the water is forced through them at a higher 15-bar pressure.

And it bears out in the coffee the machine produces: our very first cup was a gloriously smooth latte with barely a hint of bitterness. The milk-steaming wand is excellent too, producing much lighter, airier foam than the (admittedly way, way cheaper) Morphy Richards model, and there's also a hot water spout for making Americanos.

Tech

Water tank size 2L • **Pressure** 15 bar • **Milk foaming arm** Yes
• **Power** 1850W • **Dimensions** 400x330x310mm, 11.3kg

Stuff says ★★★★★

Packed with features, this is a fantastic way to make cafe-beating coffees



4 OF THE BEST

Coffee machines

Panasonic NC-ZA1

Price £400 / panasonic.com/uk

BEST FOR...
ESPRESSO
FANS

What's the story?

Like the Sage Express, the NC-ZA1 is a 'bean to cup' espresso machine: it takes whole beans, grinds them and pushes through hot water to produce a cup of coffee. That's where the similarities end, however, because the NC-ZA1 makes almost the entire process automated and controllable via a touchscreen.

Is it any good?

The water tank slides out of the front of the machine, which means you don't ever need to move it away from the wall. Every time you switch the machine on, it flushes water through its pipes. It's a bit annoying, but it has its benefits: the NC-ZA1 makes a delicious cup of coffee.

Our first espresso out of the machine was a disappointment: watery and bland. But the second was far better: rich, smooth and

right up there with the much more expensive Sage.

The touchscreen is a little basic (you have to give it a good press to have your touches register) but fulfils its role just fine. You can tweak the amount of coffee, water and milk plus the temperature before a drink is made, and save up to four of these combinations on the machine as personal favourites.

Tech

Water tank size 1.4L • **Pressure** 15 bar • **Milk foaming arm** Yes
• **Power** 1550W • **Dimensions** 410x335x195mm, 10.3kg

Stuff says ★★★★★

Coffee from the future! This robotic barista is already great, and with a few tweaks Panasonic could hit auto-java perfection



BEST FOR...
BUSY
PEOPLE



DeLonghi Nescafe Dolce Gusto Jovia

Price £70 / argos.co.uk

What's the story?

A slim and sleek machine that attempts to place itself in the hinterland between no-fuss convenience and serious coffee.

It's affordable and incredibly simple to set up and use. Simply fill the water tank with cold H₂O, pop in your chosen coffee pod, stick a cup under the spout and hit the power button.

Is it any good?

There's very little in the way of cleaning or maintenance to be done, bar an occasional emptying of the drip tray, a rinse of the removable pod holder and, of course, the refilling of the water tank. This isn't huge, so you'll need to fill it fairly frequently.

There's no steam wand for heating and foaming milk, but the Dolce Gusto system has its own way of doing that: drinks such as cappuccinos and lattes are made

with two pods: one coffee pod and one special milk pod. Drinking milk expelled from a pod isn't as appetising as fresh cow juice, but it's less effort and less mess.

So what's the coffee like? It's tasty, especially if you stick with the simpler, non-milk varieties. You have very little control over how the coffee is made, but this machine is so convenient and easy to live with that it charms you regardless.

Tech

Water tank size 0.8L • Pressure 15 bar • Milk foaming arm No • Power 1500W • Dimensions 228x171x325mm, 2.5kg

Stuff says ★★★★★

The Jovia won't appeal to hardcore sippers but its simplicity is hugely appealing: affordable and amiable

Time to chuck that jar of muddy granulated instant and make a proper cup of joe, using one of these beauties

BEST FOR...
ASPIRING
BARISTAS



Morphy Richards Accents Espresso

Price £65 / amazon.co.uk

What's the story?

Bigger, bulkier and more robust than the Jovia, this Morphy Richards machine is part of the company's Accents range of kitchen appliances, and very handsome it is too.

It's a 'proper' machine that can make both single and double shot espressos, and it'll accept both ground coffee and ESE pods.

Is it any good?

Having supped both espressos and lattes made by the machine, we're reasonably impressed. The milk foamer isn't outstandingly good but the 15-bar pressure makes for tasty, smooth coffee with a healthy-looking crema on the surface.

It requires a touch more cleaning and faffing around than the Jovia – you'll need to wipe off the foamer arm after every use – but operation is simple, with only

three buttons (coffee, power and milk steamer controls) and one dial (for the foamer) to worry about.

The price is incredibly low for a product of this standard (and represents a huge reduction from the Accents Espresso's original price of £120), making this the ideal affordable entry point to the world of decent homemade espresso-based coffee.

Tech

Water tank size 1.25L • Pressure 15 bar • Milk foaming arm Yes • Power 1000W • Dimensions 288x220x315mm, 3.6kg

Stuff says ★★★★★

A sturdy, elegant and wallet-friendly machine: a great way to step up from instant or cafetiere-made coffee

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19:02

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just say "Sony Android TV" to your phone's voice search

TV shown: X90C series

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SIMPLE, SMART, SEAMLESS

Sony Android TV finally brings two beautiful tech things together

We all know that Android on our phones is versatile, well-designed and user-friendly – it is the world's most popular OS, after all. We also know that our television is the centre of the home-entertainment hub. And yet, despite their importance in all our lives, smart TVs have lagged when it comes to their operating systems. If only smart TVs had a bit of Android about them...

Well... now they do. Sony have done the right thing and, finally, announced Sony Android TV – a mix of Sony's supreme sound and screen heritage and Android's market-leading software. We're feeling spoiled.

Not only that, this is a 4K UHD TV – it's a future-proof screen capable of the highest-resolution image currently available, offering unmatched detail, colour and contrast. This really is the smart TV you've been waiting for...

There are three major reasons, though, why Android TV works so well:

Google Cast™ Ready meaning it links to all other smart devices seamlessly; **Voice Search** that actually works... no typing needed; **One-Flick Entertainment** so you can instantly and intuitively view your pictures, music, TV and more.

We're not sure why we'd ever leave the sofa again?



Google Cast™ Ready

Via one tap of your phone or tablet, you can watch the content usually confined to the smaller screen without complicated set-up, and you can share content more easily on the big screen too. You can even use iOS.



Voice Search

Typing is so last-century. And using any virtual keyboard is never the most efficient experience. Voice Search uses Google to find what you want without pressing a single key. And this is voice recognition that really does work.



One-Flick Entertainment

This is a system that just makes using the TV easier than ever. All your entertainment is right at your fingertips through simple swiping and selecting – without leaving the main screen.

CROSSRAIL BY NUMBERS

200 MILLION

Passengers (per year)

26 MILES

Length of new tunnel (dug)

4.5 MILLION

Tonnes of earth moved

62 MILLION

Hours worked so far

WHERE THERE'S A DRILL, THERE'S A WAY

As the giant tunnelling machines of Europe's largest megaproject burrow beneath London's streets, *Stuff* descends into the bowels of the earth to meet them

Words: Will Dunn

Seven floors below the surface of London, a five-minute climb down aluminium steps that lead into the huge, concrete-lined chambers that will make up Farringdon Crossrail station, this mighty project doesn't look like a Digital Railway. It looks like an enormous hole in the ground.

Which, of course, it is, but Crossrail isn't just a physical system. In and around these immense tunnels – the platforms are so big that some station entrances will be more than a quarter of a mile apart – an invisible structure is evolving. All around us there are stations, platforms, pilings and escalators, built as digital models, visible in augmented reality, waiting to be realised in concrete and steel. Looking through

the augmented reality app built specially for the project, you can see the huge components that will be clicked into place.

This isn't just a fun app for checking out what will be here in 2018, though. In fact, the app is unlikely to make it into public use – as the site manager explains, publishing the layout of every cable and substructure of London's new transport mainline would be a spectacularly unpopular move with the police and security services. But for the people building Crossrail, and for the people who will run it for the next century – these things are built with a minimum 120-year lifespan in mind – the physical railway and the digital railway are inseparable. Without a computerised reflection of what's being ►

built, Europe's largest engineering project would be impossible to co-ordinate; there are 10,000 people currently working on Crossrail's 40 construction sites. And as the real-life tunnels and walls and supports go into place, the digital model grows and adjusts: engineers watch the components move into place through the AR app, which registers when they meet with the digital model and updates it. Measuring lasers, movement sensors and even iBeacons keep a digital eye on the real-world environment and adapt the model, not just for the engineers working on Crossrail now but also for their successors, decades from now, who will have an ever-changing digital copy to refer to.

DIGSTARTER

Work on Crossrail has been informed by London's last engineering megaproject, the Olympics – another multi-billion build in which large numbers of different contractors worked across many different sites. The construction industry is fiercely competitive and contractors are traditionally reluctant to exchange ideas, but Crossrail has pioneered a crowdsourcing project model. Ideas from any contractor are suggested, funded from a common pot of seed money and trialled on small areas of the project. If they work, they're then developed into more

widespread use. These can be simple things like printing safety advice on workers' gloves, or more technical innovations like lightweight aggregates. One particularly bright idea is to create tunnels that take the excess heat from the trains (and passengers) and turn it into electricity to feed back into the grid.

TUNNEL VISION

At this stage, though, for all its digital wizardry and forward-thinking crowdsourced ideas, Crossrail is still very much a dig. The 'fit-out' stage is yet to happen; there are no rails, cables or drainage in the new Farringdon station as we walk down the enormous tube that links the east and west platforms. The walls in the deeper tunnels still show a stubble of the stiff steel wires that are mixed into spray-on concrete to give it strength. This fibre-reinforced concrete (or 'shotcrete', as it's known to anyone with a rolled-up copy of the Screwfix catalogue in their back pocket) is hosed onto the walls at high velocity in several coats, reaching a thickness of half a metre on average. On a regular building site, the damp concrete is vibrated using power tools; in the Crossrail tunnel, a metal structure the size of a road bridge is pressed against the domed ceiling and thrummed with ultrasonic 'limpet'

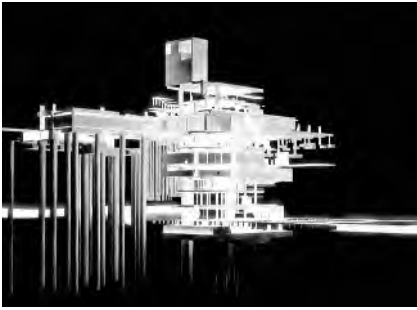
THESE 980-TONNE BEASTS CHEW THROUGH THE EARTH USING A CUTTING HEAD SEVEN METRES ACROSS

THE WORLD'S BIGGEST POWER TOOL



One of the eight tunnel boring machines (TBMs) scooping out the Crossrail railway





Above: stations, platforms, pilings and escalators are built as digital models, visible in an augmented reality app

vibrators. Once dry, it's tested for strength using a bolt-firing gun that they're only too happy to demonstrate, but which journalists are sadly not allowed to have a go on.

NOW THAT'S WHAT I CALL BORING

Heading deeper still, we reach the end of the tunnel, where a digger is tearing out sofa-sized scoops of sub-London gubbins: the behemoth tunnel boring machine has finished its work here, but the end of each tunnel is domed for

extra strength. The digger's work doesn't exactly look subtle, but above the face of smashed rock and scooped clay, an engineer's spot laser tracks the concrete dome that's forming, matching it up to the digital model that lives on Crossrail's servers.

At this stage, though, it's still the TBMs that get all the headlines, and rightly so. Like mechanoid versions of the giant sand-worms in Frank Herbert's *Dune*, these 980-tonne beasts chew through the earth using a cutting head seven metres across, laying preformed concrete tunnel sections behind them as they crawl along their routes. The ground beneath London is already a tangled mass of tubes, sewers and holes and the TBMs have to thread carefully through it, sometimes missing a Royal Mail underground line or even a Tube station by as little as a foot. There isn't even a fixed definition of what constitutes surface level in London – Farringdon, for example, was 'built on stilts' by the Victorians to avoid flooding, so the real ground level is a couple of basements below Clerkenwell Road. Speaking as someone who's had trouble parking a Nissan Micra in broad daylight, the idea of performing such delicate manoeuvres in a 150-metre-long, 1000-tonne vehicle, seven floors down, sounds tricky. I think I'll wait for the train. **6**



CHOMP CHOMP

The TBM's 'thrust force' is 58,000 kiloNewtons, which is over 3000 times the bite force of an adult great white shark.

EASY DOES IT

A ring of 10 hydraulic rams steer the GPS-guided TBM to within millimetres of its target, moving at around 100 metres a week (0.0004mph).

GIVE US A RING

As the TBM drills through the earth it pushes out rings of 1.6m-wide concrete segments, leaving freshly laid tunnel in its wake.



HOW MUCH?

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£34 BILLION

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Crossrail

£10 BILLION

2014 Brazil World Cup

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Large Hadron Collider



Give them a big hand

For serious gaming on the move you still need a dedicated portable console. So do you go Nintendo or Sony? We took the newest versions of each for a spin to find out

New Nintendo 3DS XL

What's the deal?

Nintendo went the experimental route (as it so often does) with its current portable, packing in an upper display with a glasses-free 3D effect. The new version of the 3DS XL refines that effect while making other performance, control and design tweaks all around.

Is it any good?

Yes, but it's because of the games, not the hardware itself. Truth be told, both the original and New versions of the 3DS – whether the large XL model or the smaller, standard model – feel like dated tech. The low-resolution screens are eyesores (even with new 'super stable 3D'), the processor doesn't even churn out Wii-quality graphics, and the battery life isn't great. And while the New models have refined builds, they still feel like plastic-heavy toys. But where else are you going to play Nintendo's games on the go? *The Legend Of Zelda: A Link Between Worlds*, *Mario Kart 7* and *Pokémon X & Y* can be mimicked, but not duplicated. The 3DS also plays old DS games, and has great Japanese RPGs from external studios. It's a begrudging recommendation to some extent, because we want better hardware from Nintendo, but amazing games are impossible to ignore.

Price £180 / nintendo.co.uk

Tech 4.88in 3D display ● Battery life 3.5–7 hours ● 0.85in thick, 329g ● Digital or cartridge games

Stuff says ★★★★★

It's a rinky-dink device, but Nintendo's superb games help mask its flaws

Sony PS Vita Slim

What's the deal?

Sony pushed to be more high-end with the Vita, a more traditional successor to its PSP, but also packed in a touchscreen and back touch panel. The Slim revision has extended the battery life, swapped display tech and made the Vita more comfortable to hold.

Is it any good?

Sony's handling of the Vita has spanned highs and lows. On the plus side, it's a nice piece of hardware, with a large LCD panel on the Slim that's colourful and crisp, although now surpassed by your average smartphone screen. And it's a nice companion device within the Sony ecosystem, as you can use it to stream games from your PlayStation 4 via Remote Play – a killer feature for sure. Weirdly, though, Sony has mostly stopped producing its own games for the system, especially the glossy AAA titles that sold us on its early potential. But other studios and indie developers in particular are filling the gap with smaller gems that shine as personal, portable experiences. And there's a wealth of older PSone and PSP digital games available. The release flow is waning, and we miss the big-budget games, but there's still enough great stuff coming out to keep our thumbs busy.

Price £145 / playstation.com

Tech 5in touch display ● Battery life 4–6 hours ● 0.59in thick, 218g ● Digital games only

Stuff says ★★★★★

Better hardware, neat perks and more games makes the Vita today's top portable

IF YOU ONLY PLAY ONE GAME, PLAY THIS

● On the 3DS, that's *Super Mario 3D Land*. It's a tremendously creative game in a series full of them, and it finds the perfect middle ground between the best 2D and 3D *Mario* entries. Every level feels totally unique, and there are lots of surprises to find – so keep digging.

● Got a Vita? You have to play *Tearaway*, the latest from *LittleBigPlanet* creator Media Molecule. This colourful papercraft-inspired platformer is not only wonderfully inventive and endlessly charming, but it's also one of the rare games that puts nearly all of the hardware's neat little tricks to solid use.

1 Love that LCD

Dropping the OLED screen for an LCD on the Slim was a cost-cutting move, but we actually prefer the realistic colouring on the second-gen device.

2 Bad memory

The Vita Slim has a paltry 1GB of internal storage, so you'll need a memory card for sure. They're pricey, but at least they range up to 64GB in size.

3 Ready, steady

The New models introduce 'super stable 3D', which uses an eye-tracking camera for better viewing angles. It can be disorientating, however.

4 Adapt(er) or die

The New Nintendo 3DS XL has a rechargeable battery – but no power adapter. Any 3DS, 2DS or DSi ones will work, or you'll have to buy one.

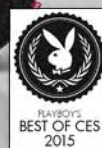


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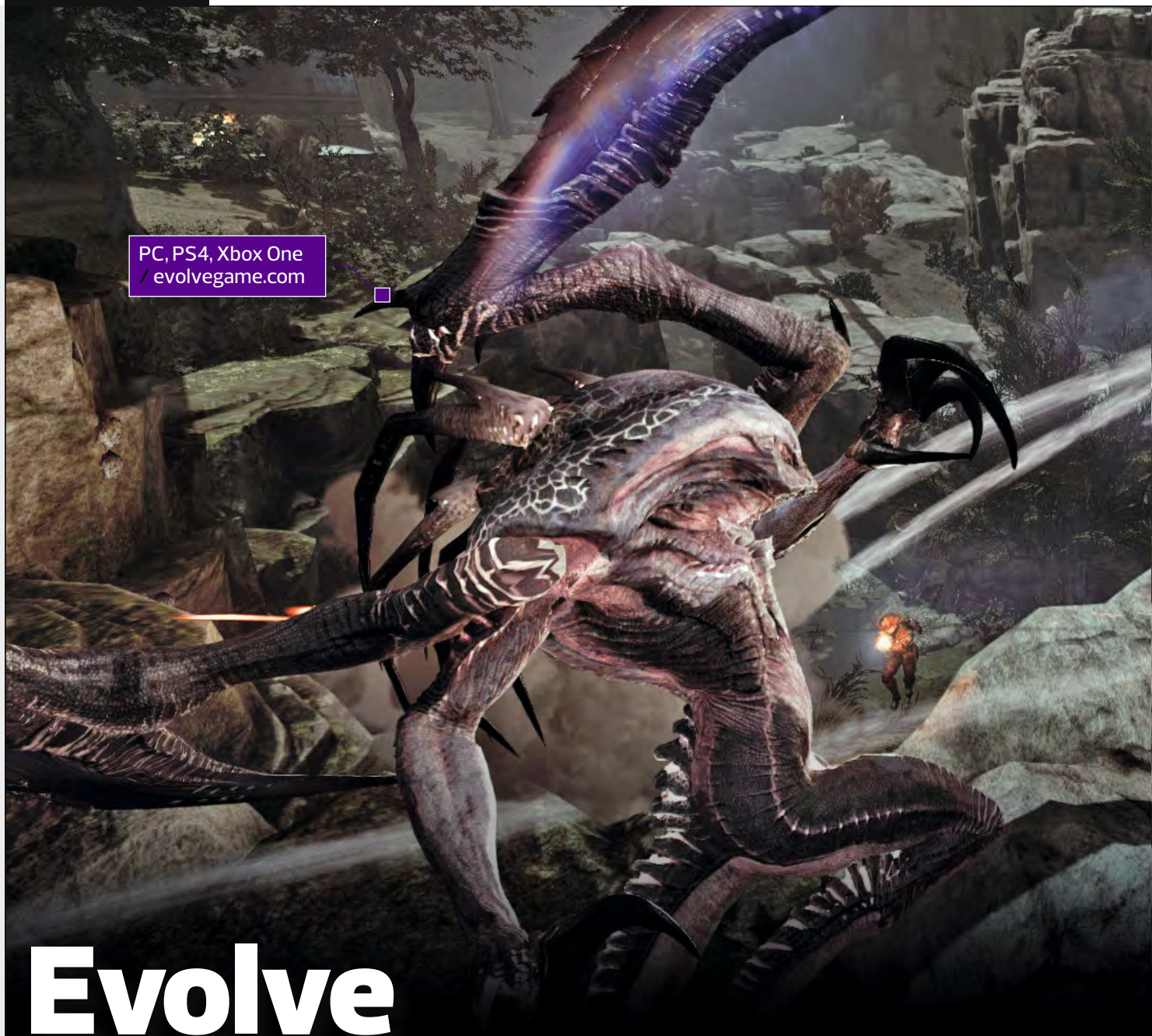
Trusted Reviews 'Recommended',
October 2014



AV Forums 'Highly Recommended',
July 2014



Home Cinema Choice 'Best Buy',
July 2014



PC, PS4, Xbox One
/ evolvegame.com

Evolve

It promises to be the ultimate deathmatch, offering the chance either to hunt a huge alien monster or to be one... but can *Evolve* live up to its monster-sized hype?

There's no other game quite like *Evolve*, and having put hours into playing it, I think I know why: it's because it doesn't really know what it's trying to be.

The game revolves around team deathmatch, but these teams aren't equal – in numbers, anyway. This is four against one, with the one being a nasty monster and the four being hunters out to kill it.

At the beginning of each round the monster is fairly weak – it needs to put some distance between itself and the hunters

so it can devour the wildlife in order to evolve to its biggest, most dangerous form. Clearly that's not in the hunters' interests, so it's up to them to track the beast down while it's still manageable.

Within the team of hunters there are specific roles. The Trapper keeps the monster in place, the Assault deals the damage, and the Support and Medic try to keep everyone alive with shield buffs and healing. And this is the main problem: it's just too prescribed. Success for the hunters revolves

around everyone doing exactly the job they're supposed to do, which means teams that contain a weaker player are pretty much doomed, while teams full of pros will largely go through the same motions every time.

Stalking a huge beast through an alien jungle sounds thrilling, but it's too fast and too signposted to create tension: you just race along a path of glowing footprints. The controls are a bit imprecise, and the fact that all the characters seem to be able to absorb huge

amounts of damage makes every attack feel a bit pathetic.

The case isn't helped by an arcane pricing strategy: it's complex, but what it boils down to is that buying the game only gets you a few characters, and you have to buy the rest later as DLC.

For a certain type of player (the ultra-competitive, e-sports-loving type) *Evolve* is a dream come true. But most gamers will struggle to find many long-term thrills in this hunt.

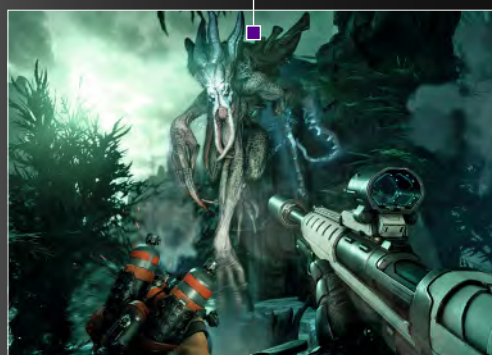
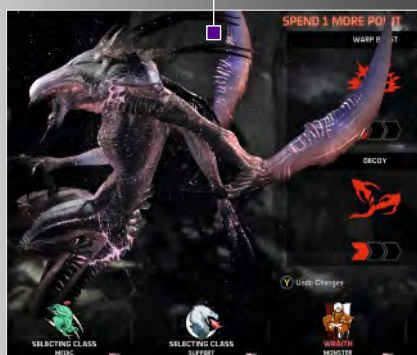
Tom Parsons

STUFF SAYS *Evolve* just isn't as much fun as it sounds, and that's a massive shame ★★☆☆☆



There are three monsters to unlock, and more to buy as DLC

You'll be fed up of the unfunny 'banter' within an hour



Hunting for story

So, what if you're after more than simple deathmatch? What if you want some story and some variation? *Evolve* does have a story mode, and it's interesting, if not quite what you'd expect.

For a start this is still deathmatch, but it's a string of five matches over different arenas and game modes, with the balance shifting depending on who won last. So if the hunters win a round, they might get enhanced automated turrets for the next one, making it harder for the monster – which, let's remember, has just lost. To counteract that, the monster gets a buff to its abilities. With one hand *Evolve* giveth, with the other it taketh away.

The different modes do inject a bit of variety, and the rescue mode neatly turns the tables with the hunters doing the running and the monster doing the stalking. And the overarching idea of evacuating a planet over a number of games gives some impetus to your actions – at least for the first couple of times.

But don't go thinking this is some epic yarn, and don't go thinking there's as much here for the solo player: you can play on your own, but the other roles will simply be filled by computer-controlled bots.



PS4 / theorder1886.eu.playstation.com

The Order: 1886

Victorian London has a werewolf problem. Fortunately, you have the fancy guns and even fancier mutton chops to solve it

Some people think value and quantity are inextricably linked. They think that if they get anything less than 50 hours of play from a game they've been ripped off.

I fall into the other camp: the camp that says the quality of the experience is what counts... and yet, even I have issues with the brevity of *The Order*.

It's not really that it's short, although £50 for eight hours of gameplay (and I took it slowly) will definitely upset some people. It's that it ends so abruptly, and right at the point where you feel you're getting to the meat of the game. It's a bit like watching the pilot for a great TV series and then finding out it'll be two years before you see the next episode.

With the game being linear and lacking in significant collectables there's little reason to replay it, especially as there's no multiplayer or horde mode. This will be a regular at the trade-in counter.

It's a shame, because what there is of *The Order* is impressive and enjoyable. Its knights-vs-

werewolves plot is told through immaculate cutscenes that drip-feed background and plot points; the steampunk-ish tech and fantasy elements blend seamlessly with a vision of London in 1886 that oozes with authentic detail and texture; the weapons looks, sound and feel experimental and genuinely unique, but they still make perfect sense.

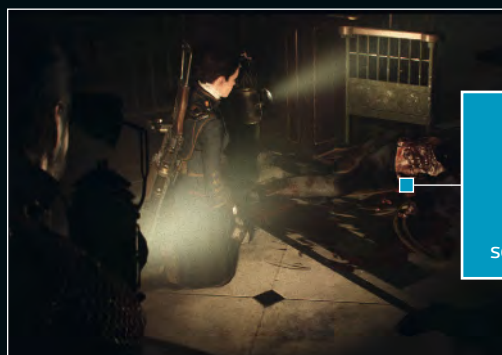
The Order owes a great debt to *Gears Of War*. It's all crouching behind cover before popping out to take shots at your similarly ensconced enemies. There are fewer tactical options, though, with the action being far more directed and closed-in. You're playing a story here and deviation is not encouraged – a feeling that's backed up by the use of quick time events (those on-screen prompts to press certain buttons at the right time) for boss fights.

For me that's fine in a game with a great story, and this story is pretty great. Unfortunately, I also feel like I've only really experienced about a third of it.

Tom Parsons



Found a hair in your soup? Complain directly to the chef... with guns!



Tracking a werewolf through an abandoned hospital is scarily brilliant

STUFF SAYS Good while it lasts, but it's over before it really gets going ★★★☆☆



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Media hoard

This month's scalding-hot releases for fans of gangster movies, punky riffage, spaceship novels and everything in between

WATCH

Hyena_cinema

After British gangster flicks got Guy Ritchie'd in the late '90s the genre found itself in something of a rut, forever associated with Ocean Colour Scene, Vinnie Jones and that bloke off the 666Bet advert (no, not Harry Redknapp). But if *Kill List* gave it an injection of the occult, *Hyena* well and truly brings it back to life.

Peter Ferdinando plays crooked copper Michael Logan, the Alex DeLarge of his badge-carrying, cocaine-and-Carling-fuelled droogs, who are all too keen on a spot of the old ultraviolence and helping themselves to a bit off the top. When a pair of Albanian brothers – one of whom can make eating carrot batons a masterclass in intimidation – upset the mutually

beneficial status quo that Logan and co have going with a local gang, the line between cops and robbers becomes almost impossible to discern, especially when investigations begin from within the force.

It all sounds as if it might become tediously familiar but *Hyena* has the plot twists, pace and performances to pull it off. Then, just as the film is ready to reach the crescendo it's been frantically building towards, it ends, as if it can no longer bear to support the weight of everything that's gone before. For some that will spoil the experience, but for others it'll bring blessed relief.

Tom Wiggins

STUFF SAYS ★★★★★



Nightcrawler_cinema

The fearmongering news media is a great subject for a film, and Jake Gyllenhaal is impressively repugnant as an ambulance-chasing cameraman. Sadly the film misses the opportunity to say something interesting about the why and the who of Fox News and pals, instead sticking to its guns (literally) as a thrilling, but cartoonish, action flick.

Will Dunn

STUFF SAYS ★★★★★



Hinterland_cinema

A man and a woman, close friends who grew up together, spend a wintry weekend by the sea. They love each other in one way or another; the film is about what that 'one way or another' might mean. It's as intimate and low-key as staring in the bathroom mirror (literally) as a thrilling, but strangely memorable.

Richard Purvis

STUFF SAYS ★★★★★

LISTEN



Shedding Skin

Ghostpoet might sound like the name of Marvel's new literary superhero ("He fights with words, not weapons") but that's not all Obaro Ejimiwe has in common with a costumed vigilante, because *Shedding Skin* sees him undergoing a transformation.

The laid-back, almost spoken-word delivery that won him a Mercury Prize nomination in 2011 is still there but his decision to use a full band for the first

time gives the album a jazzier, trip-hoppy feel, although thankfully without the associated dreadlocks and Bristolian bongos. It's less menacing than before, but there's still drama with more hope, particularly on the cinematic title track and the smoky, noir-ish *That Ring Down The Drain Kind Of Feeling*.

Tom Wiggins

STUFF SAYS ★★★★★



Restarter

With a rhythm section that sounds like tectonic plates being battered with the skull of a blue whale and guitars that rumble from the depths of a prehistoric cave (and that's just the singles), we'd recommend keeping Torche's thundering third album hidden under your bed, because it strides forward with the unstoppable purpose of a monster.

Tom Wiggins

STUFF SAYS ★★★★★



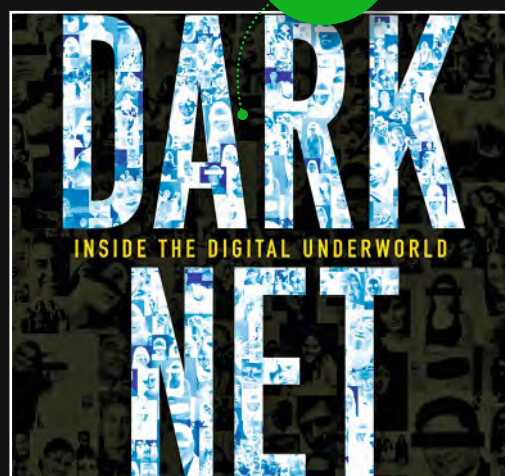
For All My Sisters

More than a decade after their debut album, it'd be easy to assume The Cribs would have settled into thirtysomething by-the-numbers-ness. Easy but wrong. *For All My Sisters* is packed with so many punchy, punky riffs and urgent choruses that it could be the work of a band just starting out. No complacency here.

Marc McLaren

STUFF SAYS ★★★★★

READ



The Dark Net

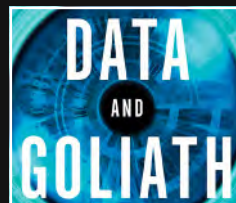
The internet's a vast city with its shops, gaming arenas and residential areas. And like all vast cities, it has districts and communities that exist outside of the mainstream and where unsavoury, illegal or sometimes just 'alternative' activities take place. And it's this hidden online world that *The Dark Net* explores.

Think of it as *A Rough Guide To The Internet's Naughty Bits*, with author

Jamie Bartlett journeying from paedophile forums to fascist newsgroups and from Bitcoin mailing lists to hacker havens. It's fascinating, eye-opening stuff, even for those of us who think of ourselves as Net citizens; like walking round a corner and discovering a part of your home city that you've never been to before.

Marc McLaren

STUFF SAYS ★★★★★



Data And Goliath

Everyone knows that net surveillance exists, but few know how deep the rabbit hole goes or what to do about it. This manifesto from security expert Bruce Schneier is a laudably balanced exposé of 'public-private surveillance', but one that leaves you with the sense that print arguments alone will only give Goliath a paper cut.

Mark Wilson

STUFF SAYS ★★★★★



Dark Intelligence

Describing this as a 'romp' would be to belittle its intelligent themes about transformation and sacrifice... but there's no denying that the mix of grumpy AIs, lethal drones, broken humans and huge space battles is heady and moreish. Fortunately, this is the first of a new series by British sci-fi master Neal Asher, so more we will get.

Fraser Macdonald

STUFF SAYS ★★★★★

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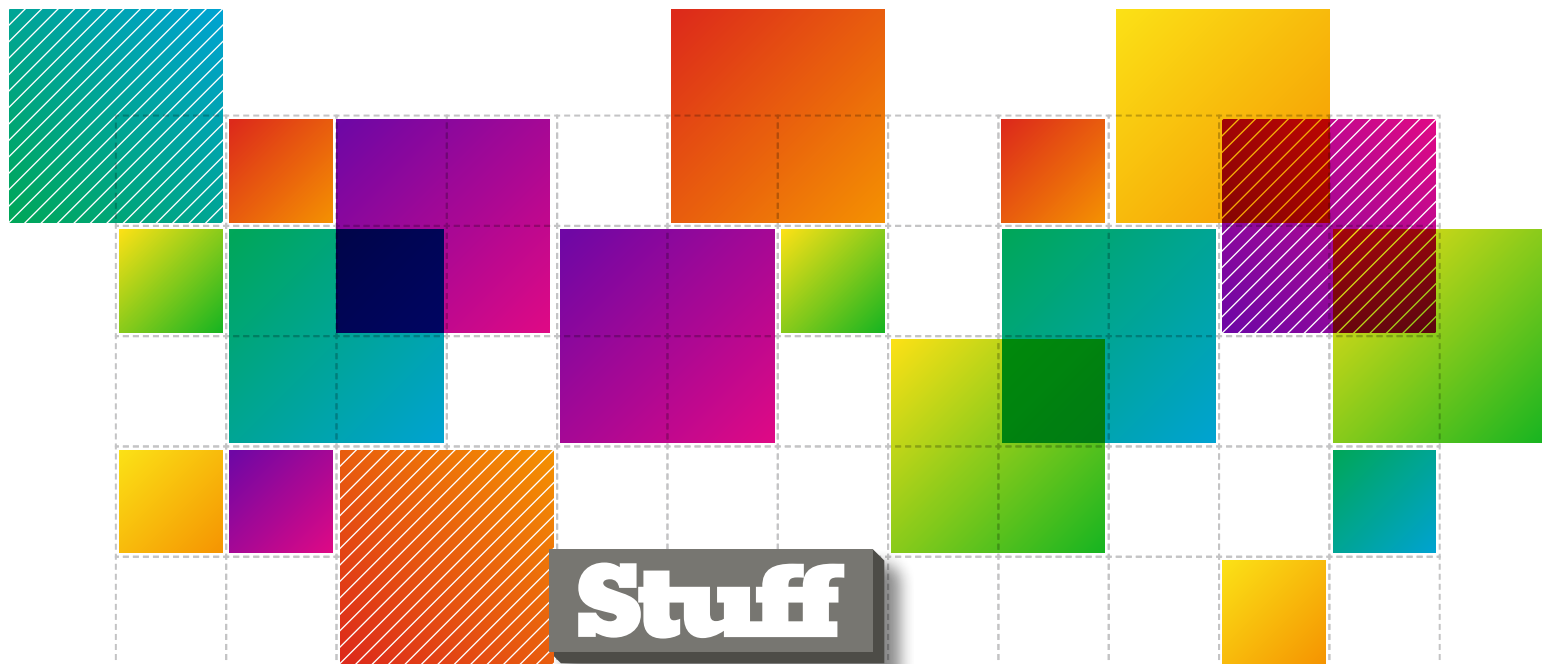
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p110 BETA YOURSELF: 3D PRINTING With a little know-how and the right machine, you can make anything	p112 PLAYLIST: TECHSPERIENCE DAYS Flying, flyboarding or fleeing from the undead	p114 SUPER GEEK: MICROSCOPES It's CSI time; put on your white coat and lead the way to the lab	p116 INSTANT UPGRADES: KITESURFING Kit up for throwing some shapes on the waves
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BETA
YOUR-
SELF

3D PRINTING

3D printing sounds really fun, but also impossibly complicated. Where do you start? Adam Oxford shares lessons from the coalface of the maker revolution

THE BASICS

■ **Printer types.** There are three main types of 3D printer: one that heats up a filament and squirts it out in layers (FDM), and two types that fire lasers into either liquid resin (SLA) or powder (SLS) to solidify a model one layer at a time.

■ **What's mine called?** Melting plastic filament and firing it through a nozzle is called 'extrusion', and these printers are much cheaper and more common. The CEL Robox and Makerbot Replicator use this FDM process. SLA and SLS printers can deliver better results but they're more expensive.



■ **The easy option?** Preassembled machines used to be prohibitively expensive, but they're now more or less as cheap as home-made ones. They can be up and running in minutes, but bear in mind...

■ **You'll get your hands dirty.** Even ready-assembled printers are often fragile machines that

need care. Learning the basic mechanics from the RepRap glossary (reprap.org) will make the inevitable troubleshooting much easier.

■ **Open vs closed.** If you want to get under 3D printing's bonnet, go for a printer with an open-source design that can print its own spare parts. Some printers use a lot of proprietary tech and can't be upgraded.

■ **Choose your plastic.** Desktop 3D printers mostly use two types of plastic: vegetable-based PLA and oil-based ABS. PLA is much easier to work with, but ABS is less brittle and doesn't look as glassy.

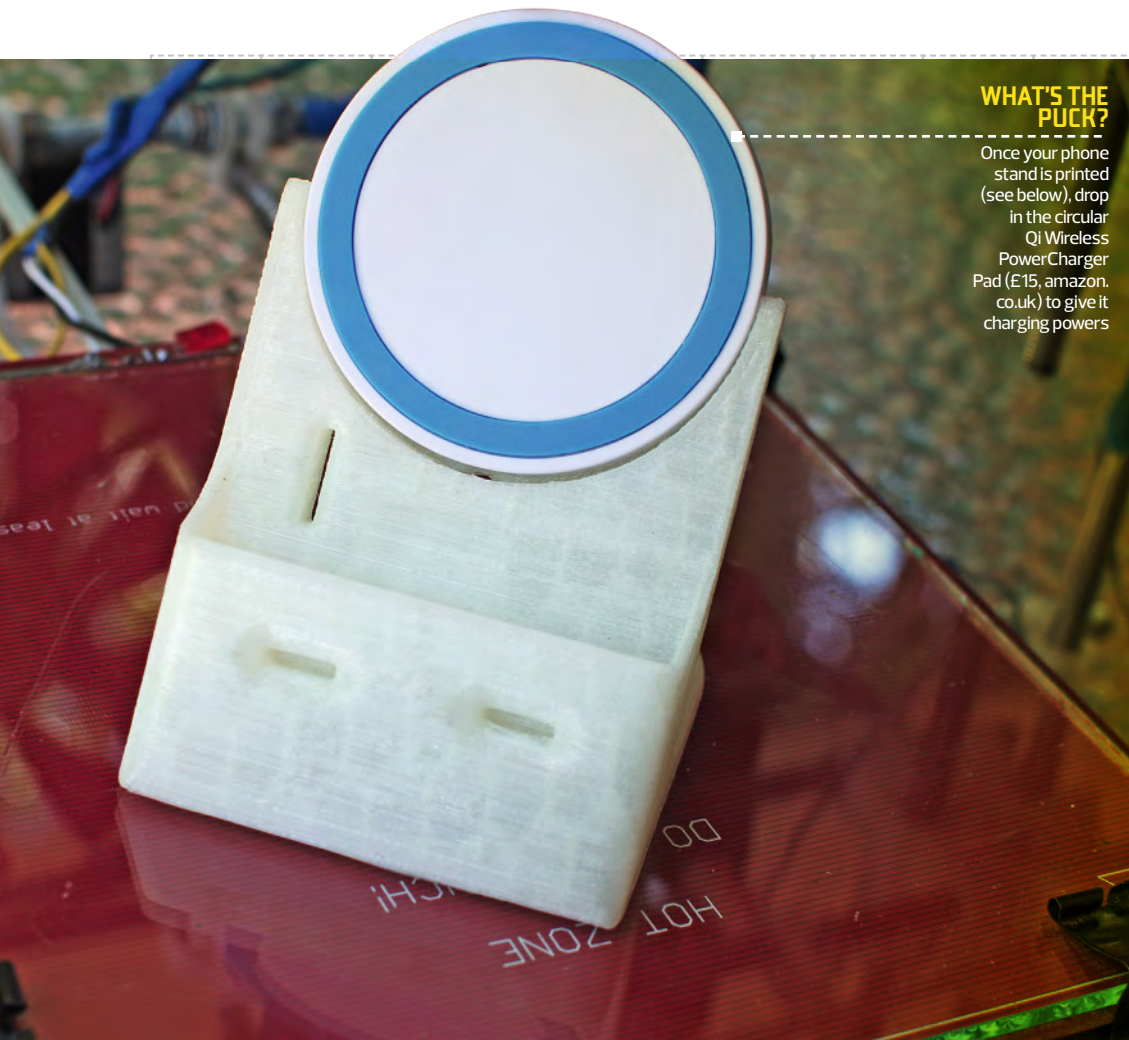


LEARN THE LINGO

■ **Thingiverse.** The largest repository for 3D printable models. If there's something you want, chances are someone has uploaded a design for it already.

■ **STL.** The StereoLithography file (.stl) is the most widely used format for 3D models.

■ **Slicing.** You have to 'slice' an STL file into layers using a program such as Slic3r. This turns a 3D model into the programming language 'gcode', so your 3D printer can read it. Your printer's software may have a slicing program built in.



WHAT'S THE PUCK?

Once your phone stand is printed (see below), drop in the circular Qi Wireless PowerCharger Pad (£15, amazon.co.uk) to give it charging powers

LEVEL UP WITH...



LEARN TO MODEL

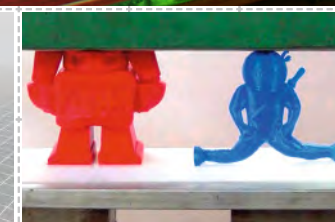
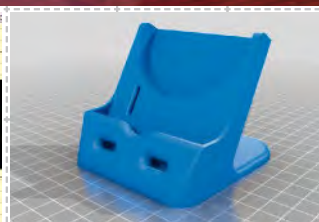
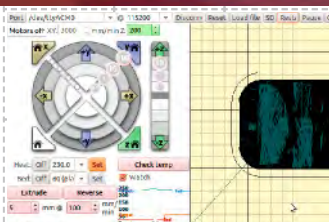
tinkercad.com
Once you can 3D-print with confidence, you'll want to have a crack at designing your own models. Either for fun, or because there's a particular thing you need to print. 3D modelling isn't easy, but pared-down web-based apps such as Tinkercad will help you get started and ease the pain of the learning process.

MAKERS

THE NEW INDUSTRIAL REVOLUTION
CHRIS ANDERSON

MAKERS: THE NEW INDUSTRIAL REVOLUTION

£9 / waterstones.com
Chris Anderson's book will show you just how important your new 'toy' is. Anderson explains how 3D printing and hardware hacking is evolving from a hobby for enthusiasts to the engine of a whole new economy based on low-cost prototyping and bespoke designs.



PRE-PRINT

■ Calibrate the print bed.

Some are automatic, but most need to be levelled every few prints. The tip of the hot end should be about the thickness of a sheet of paper from the bed.

■ **Prepare your bed.** Different printers have different beds and preparation methods. If heated, make sure the temperature is correct for the filament type.

■ **Always push.** If clearing a filament jam, never pull it back up through the extruder. Instead, heat up the hot end until liquid plastic runs out, and clear it by pushing new filament through.

THE PRINT

■ **Get your model.** The phone stand above holds a Qi wireless charging disc plus a phone of any size up to a Galaxy S5. We printed it in glow-in-the-dark PLA, perfect for a bedside table.

■ **Slice the model.** Set parameters such as print speed, support for overhangs and the temperature for the hot end.

■ **And print.** If it has an LCD screen and SD card reader, you can load the gcode directly into the printer. But if you drive your printer over USB, you may need software such as Pronterface.

THE NEXT STEPS

■ **Spool around.** ABS and PLA are the most popular filaments, but companies such as Ninjabflex and ColorFabb are making glow-in-the-dark and metal-infused filaments more popular.

■ **Alter the speed.** You may be able to change the speed by tweaking code in the controller firmware. Slower movement can solve some problems.

■ **Change the hot end.** Many open-source printers use a standard hot end or 'J-Head', so it's easy to find a new one with a wider or narrower nozzle for faster or more detailed printing.



JOIN A MAKERSPACE

sites.google.com/site/ukmakerspaces
Once you're over the novelty of your new printer you'll want to find new challenges to keep it interesting. Maker communities online and off are the place to find inspiration for your prints, learn new things you can do with your machine and meet like-minded makers.



PLAYLIST

TECHSPERIENCE DAYS

You've stayed indoors for several months now, so it's time for a spring day out. Here's our pick of the UK's best activities and destinations for tech-themed larks aplenty

2.8 Hours Later various locations

A zombie-themed cross between an Easter egg hunt and the playground game 'it': your team tries to make its way around secret locations without being caught by the undead. Both humans and zombies are then invited to an apocalyptic disco into the early hours.

£38 / 2.8hourslater.com



Jaguar Heritage Driving

Warwickshire

The E-Type is the most beautiful car ever made, everyone knows that. But few know what it's like to drive one, which is why this is so darned appealing. You get a few laps in the classic and can also compare it to the modern, and brilliant, F-Type.

£250 / jaguarheritagedriving.com



Segway Rally

various locations

Can't find a Sinclair C5 drag race? Try an off-road Segway. You get one hour to 'rampage' around a forest course at the supercharged broomstick's top speed of 12mph. If you want more adrenaline, the same company offers 4x4 quad-biking days.

from £35 / amazonlocal.co.uk



The Heart Of Gaming

Acton, London

If rain has stopped outdoor play, head back to your youth at this gaming haven. Home to dozens of classic machines and console games, the venue welcomes party bookings and tournaments, or book an overnight stay for an extra £5.

from £5 / thehoguk.com



Spitfire Flights

West Sussex

It's one thing gawking at a grounded Spitfire in an airfield, quite another strapping into one of the few remaining airworthy planes and soaring over the Sussex countryside. If you have deep pockets, Boulbee also offers introductory pilot courses.

£2750 / boulbee-flightacademy.co.uk



Mini You

Clerkenwell, London

If 3D printing is a religion, the iMakr Store is its church. There are free workshops, and if you book the 20-minute scanning service you can order anything from a 6.5in figurine to a life-size model of your head. Not that you're a narcissist or anything.

from £170 / mini-you.co.uk

Jodrell Bank

Cheshire

Join the country's top astronomers as they peer into the depths of the universe at the Discovery Centre. Astrophotography Night is on 11 March, and later in the year there's live music. Glasto might have Lionel Richie, but does it have the world's third-largest steerable dish radio telescope?

£7 / jodrellbank.net





INTERNATIONAL PLAYTIME

If you're holidaying near these joyfully nerdy attractions, make sure you buy yourself (and us) a ticket...



MINIATUR WUNDERLAND

You might dispute a model railway's tech credentials, but this £8m set in Hamburg isn't your average Hornby. It has 13km of track and software-controlled emergency services who tackle blazes and speeding motorists. miniatur-wunderland.com



FORMULA ROSSA

Abu Dhabi's Ferrari World is an indoor theme park with a rollercoaster that rockets you out into the desert at 149mph. It's the world's fastest coaster and probably the only one that needs to give its riders mandatory goggles. ferrariworldabudhabi.com



PAN AM EXPERIENCE

In the '70s Pan Am was like a flying Michelin-starred restaurant. The airline went bankrupt in the early '90s, but a Hollywood studio (home to the sets for *Airplane!* and *Lost*) has created a replica 747 for gourmet four-course meals. airhollywood.com



Flyboarding various locations

Still waiting for your personal hoverboard? Strap on your jet boots and rise up to 10 metres above the surface of the water, spurting spray like a futuristic water boatman. The high-powered hoses from your feet provide the lift-off; you provide the superhero poses. [from £55 / wish.co.uk](http://from£55/wish.co.uk)



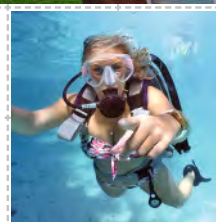
Kelvedon Hatch Nuclear Bunker Essex

Inside this squat brick bungalow is a corridor leading deep into the hillside. This spooky relic was, for much of the Cold War, where the government would have hidden from a nuclear attack. Don't miss the cheerily apocalyptic audio guide. [£7 / secret nuclearbunker.com](http://£7/secret.nuclearbunker.com)



Futurefest London Bridge, 14-15 March

Waiting for the future in real time is frustrating. Luckily this next-gen festival is here to help, with talks from the likes of Edward Snowden and funk god George Clinton, plus semi-autonomous robots and a 'neurological thrill ride'. [from £50 / futurefest.org](http://from£50/futurefest.org)



Microdive Course various locations

Scuba diving is like flying underwater but learning to dive is... well, boring. The 5m Microdive course takes a day, skipping the navigation and depth lessons of standard courses. You can only dive in shallow, tide-free water – but that's all you'd want to do. [from £40 / microdive.com](http://from£40/microdive.com)

SUPER
GEEK


MICROSCOPES

Seasoned 'scoper and science writer Dr Jamie Condliffe explains why becoming an amateur analyst of the world in miniature can bring some surprising perks

When I worked in a laboratory studying for my PhD, I used a microscope almost every day. Taking a tiny sample, barely visible to the naked eye, and sliding it under the lens of a microscope is like stepping into *Honey, I Shrunk The Kids*: it's a whole different way of seeing the world.

We've not always been able to see in such minute detail. While the first microscopic lenses were made in the 1500s by father-and-son team Zacharias and Hans Janssen,

it wasn't until Galileo worked out how to focus images in the 1600s that they became really useful. Then fast-forward to the 1800s and a chap by the name of Carl Zeiss created the first ever compound microscope.

That's the same design you've used at school and seen in laboratories – and the kind I sat at for days on end. While its appearance may have changed little in 200 years, the optics have improved dramatically, with lenses ground with ever-increasing precision, and digital imaging now makes

it incredibly easy to record and analyse what you're looking at.

Capable of magnifying things by up to 2000 times their original size, lab-grade microscopes allow scientists to understand how the world works at its most basic level. That can mean seeing deep inside cells and across the surface structure of exotic materials or even fault-checking the minuscule circuits on computer processors.

But the most exciting thing about microscopy for me is that it's getting more affordable. You no longer have to be a university

professor or in secondary school to see things up close, because high-quality lenses and digital sensors have dropped so much in price. And actually, a lot of hobbies can benefit from taking a closer look at things, whether you're tying your own flies to fish with, inspecting the soldering on your own circuitry, or making sure collectibles like trading cards are legit.

And, yes, with a 100x lens you can even count your own sperm. Best keep that one away from the annual family slideshow, mind.

JARGON BUSTER

■ OBJECTIVE LENS

The part that magnifies the sample, zooming in by anything from 10 to 2000 times (written as 10x or 2000x). At 40x zoom you can see cell shapes; at 100x you'll see individual bacteria.

■ SPECIMEN STAGE

Where you place a sample for inspection. Many microscopes allow you to move this in small increments – forward, backwards, left and right – which means you can view more of the specimen without disturbing it.

■ FOCUS SYSTEM

This allows you to gently move the specimen stage up and down to get it in focus. More expensive models provide a second ultra-fine control to get the image razor-sharp.

■ EYEPIECE

Unsurprisingly, this is what you look through. But it's often replaced with an image sensor similar to those in digital cameras to store images for analysis.


THE
HAND-HELD
HERO

TTS EASI-SCOPE

It may have been designed with curious children in mind, but this little hand-held device is the point-and-shoot of microscopes. It plugs into your computer via a USB cable to display an image of whatever you hold it against on the screen. An LED illuminates whatever you're looking at from the top, which means it's perfect for inspecting opaque samples, and it provides up to 43x magnification. Be warned, though: the zoom's partly digital, so the images you capture will not be wonderfully crisp, and there's no focus system either, so you'll have to keep a very steady hand.

£40 / tts-group.co.uk


THE
HOBBYIST'S
CHOICE

CELESTRON LCD DIGITAL MICROSCOPE II

With 4x, 10x and 40x objective lenses, this is a serious microscope that will allow you to see things as small as biological cells. Its adjustable mechanical stage makes it easy to move samples around, while the eyepiece has been completely replaced with a built-in 5MP digital camera and a 3.5in TFT LCD screen. An SD card lets you transfer your findings to a computer for further analysis – or you could use the TV output to show the rest of your family what you're looking at. It's got to be better than *The One Show*.

£250 / celestron.uk.com



THE
PROFS'
FAVOURITE



ZEISS PRIMOSCOPE POL

If your ambitions are more scientific than recreational, a proper lab-grade microscope is what you need — and the original microscopists at Zeiss still lead the pack. With objective lenses offering up to 100x magnification, the optics in this microscope are, as you'd expect, world-leading. But heritage has given way to innovation recently, and now Wi-Fi connectivity allows you to control the 'scope with an iPad or beam the pictures that its digital sensors acquire to any computer on the local network. If this still isn't geeky enough for you, it's time to get a job as a scientist.

£7000 / zeiss.co.uk

NOW ADD THESE...

OMERO

Once you've acquired some images using your microscope, you'll want to do something with them. Omero is a free piece of software used by thousands of scientists to store and catalogue their microscopic images in over 130 formats. It lets you measure features, count objects, stitch images together, and generally pick your close-ups apart, pixel by pixel.

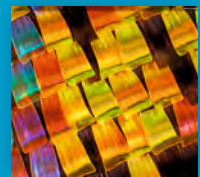
openmicroscopy.org



CELL SIZE AND SCALE

If you're not quite sure what level of magnification you need to see something under your 'scope, this interactive tool from the University of Utah will be invaluable. It lets you zoom in to compare the size of objects — from a coffee bean that measures 8 millimetres across to a carbon atom that's just 0.0000003 millimetres in diameter.

learn.genetics.utah.edu/content/cells/scale/



MICROSCOPYU

Want to find out more about using your microscope? Then head over to Nikon's online training centre, which will answer pretty much any question you have — from how to get the clearest images to the safest ways to look at live cells. It's also stuffed full of beautiful images from the annual Small World microscope photography competition, which are something to aspire to.

microscopyu.com

KITESURFING

A vibrant, stylized illustration of a kitesurfer in a black wetsuit and helmet, riding a wave. The kitesurfer is holding the handles of a large, red and blue kite. The background features a sunset sky with clouds and several other kites of various colors (orange, green, yellow) flying in the distance. The water is splashing around the kitesurfer's feet. The overall style is dynamic and energetic, with a focus on the sport of kitesurfing.

6 INSTANT UPGRADES

KITESURFING

Leave your two-line stunt flyer stuck in that tree — it's time to graduate to something a little more gnarly with this wave-shredding, wind-swooping gear...

WHAT IS KITESURFING?

A watersport crossover between power kiting and wakeboarding, kitesurfing uses big floating kites with inflatable struts to get you screaming across the waves, and (hopefully on purpose) soaring high above them.

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1 NORTH REBEL

You may want different-sized kites depending on both your weight and the strength of wind you ride in, but one of the first in your quiver should be a North Rebel. It's a design that's evolved continually over a number of years, but its focus is still on all-rounder ability. It's also easier to control than many kites when the wind really picks up thanks to North's 'fifth line' design, which allows extremely effective 'depower', letting most of the wind out of the kite so you're still in charge when it starts gusting.

from £810 / edgeriders.com



2 ZION STRIKE SELECT

As soon as you start getting cold, you'll lose the strength in your limbs and, let's face it, feel generally miserable. To make sure you can stay out there as long as possible, you need a snug-fitting wetsuit to keep you toasty while you work on your wavestyle. The Strike Select is a colourful, 5mm-thick semi-dry wetsuit that will make you stand out from the rubbery masses, and has handy features such as flexible 'ninja knees' and padded shins to take the sting out of any contact with the sharp edges of your board.

£360 / roho.co.uk



3 PKS KITESURFING STRUT GOPRO MOUNT

You can't pilot a drone to film yourself while you're skimming across the waves, but that doesn't mean you can't get killer aerial shots of your massive aerials and spectacular wipeouts. This straightforward GoPro mount attaches to one of the inflatable struts that help your kite keep its shape (and float). Once it's Velcro'd in place you'll have your very own eye in the sky, which you should be able to control using the GoPro's remote accessory.

£35 / s2as.com



4 MYSTIC PREDATOR

Why would you need a helmet on water? Well, it's not the water you have to worry about but rocks, other kitesurfers and, probably most of all, your own board. They'll all turn your melon to mush if you hit them with enough speed or fall from a great enough height onto them. Made of impact-resistant thermoplastic, the Predator protects your noggin from all these dangers, while keeping water out of your eyes with its brim. It even has removable earcups to keep you warm when it's really blowing a hoolie.

£60 / coastwatersports.co.uk



5 SLINGSHOT MISFIT

Unless you've got a board, it's just you being dragged through the waves at speed. The Misfit is a versatile, twin-tip freeride board suitable for beginner to advanced levels. Twin channels on the underside improve grip and boost board speed, helping you go upwind quicker – something you'll be particularly thankful for when that's the direction home. Its fastrack mounting system helps you find your perfect foot position and the Columbian Gold wood core gives it better 'pop' for leaping off the water.

£380 / powerkiteshop.com



6 DAKINE RENEGADE HARNESS

Unlike in windsurfing, you'll be using a harness from day one. It's what keeps you attached to the kite and takes all your weight, so you'll want one that's nice and comfortable. The Renegade offers a quick lock system for attaching the spreader bar and plush memory foam padding to keep it comfortable. There are also lots of neat features such as webbing ties, places to put your car key (no more leaving it under the wheel arch) and a dual-blade hook knife for cutting your lines if things get really out of hand.

€160 / bwsurf.eu

WHERE TO KITE SOME SURF

BRITISH KITESPORTS ASSOCIATION

If you've never been kitesurfing before, it's essential to get some training – this is not something to dabble with on a whim. The national governing body has links to every school in the UK, with one-day courses starting at around £100.

britishkitesports.org



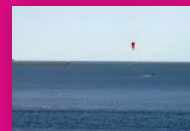
SHOREHAM BEACH, WEST SUSSEX

A few miles away from the bright lights and limited parking of Brighton, this similarly pebbly spot offers kitesurfing opportunities from wind-blown waves at high tide to calmer, shallow waters at lower tides.



ISLAND OF TIREE, HEBRIDES

If you want to be alone with the sea, this island off the west coast of Scotland, north of Glasgow, could be just the spot. Offering wind in abundance, as well as beaches to suit all conditions, it's definitely worth the pilgrimage.



THE RAY, SOUTHEND-ON-SEA, ESSEX

An hour's drive east of London, this is one of the most convenient spots to get some time on the water near the capital. Around low tide a protected lagoon appears, offering flat water and high speeds for kitesurfing when the wind picks up.

G A D G E T

D O C T O R



ALWAYS ON CALL

facebook.com/joinstuff ● @stuffTV
google.com/+stufftv ● stuff@haymarket.com



MAIL OF THE MONTH

Q PORTABLE GAMING NIRVANA

Hi Stuff, I'm a member of the WHO and am deploying to Sierra Leone to help Ebola clinical trials. I'm looking for a micro PC, pico projector and controller to churn through time-killers such as *Skyrim* and *Fallout 3*. Any ideas?
Theo Grace

A That's quite a trek, Theo – good luck! As for what to take, we'd recommend the tiny Alienware Alpha (from £450, dell.com), which should pack enough grunt to run a whole host of titles. The Asus S1 pico projector (£270, amazon.co.uk) has plenty of good reviews too, with 200 lumens of brightness for decent visibility.

Speak your brains and you could win a 6-month **QOBUZ HI-FI SUBSCRIPTION** worth £120
This letter wins 6 months of unlimited streaming in lossless-quality FLAC from Qobuz, worth £20/month

**Q** SORT-OF SMARTWATCH

Hi Stuff, I want a cheap smartwatch to track my steps... and that's about it. I don't care about music playback or fancy messaging skills, I just want something that will last me more than a week so I can ditch this stupid pedometer for good. Cheers!
Cheryl

A A pedometer, eh? It's definitely time to upgrade. The Withings Activité (£320, withings.com/uk) is a smart-looking watch that can track activities and steps, without looking like a fancy smartwatch. The best part? It runs on a normal watch battery and will keep ticking away for a very impressive eight months.

Q POWER TO THE PEOPLE

Help! I've got too many gadgets and charging them all to make sure they're topped up is becoming a real pain. There has to be a better way. Is there an all-in-one solution for all my Android and Apple gear?
Kyle Parke

A There sure is, Kyle. You need something like the Anker 40W five-port USB charging hub (£20, amazon.co.uk). It lets you juice up five gadgets simultaneously, delivering the fastest possible charge because it offers up to 2.4 amps per port. Now go and plug them all in, and relax for a bit. Once you've gone multi-charge, you never go back.

**Q** TUNE ME OUT

Hi Doctor. I haven't got a TV in my room, just a PC monitor attached to an HDMI splitter for my laptop and Xbox One. I'm sick of having to watch rubbish programmes about sewing and baking downstairs, but don't really want to fork out for another TV or extra box. Any ideas?
Tristan H

A Yep. The Xbox One digital TV tuner (£25, argos.co.uk) will make all your dreams come true. Well, it'll solve your TV woes anyway. Plug it into your Xbox One and connect it to an existing coaxial (aerial) cable, and you'll be greeted with HD Freeview channels and the ability to control them all with your voice, thanks to Kinect. A standalone antenna should sort you out if you don't have an existing cable, and can be had for around a tenner on Amazon.

Q SMART BREW

Hi Stuff, I need some help out-geeking my mates. We're constantly trying to one-up each other, from smart watches to tablets, and even T-shirts with



built-in screens. Have you got anything to give me the edge?

Dietvorst

A A noble (yet expensive) cause, and we've got something that should definitely give you the edge, in terms of both geek points and keeping you awake in the morning: a Wi-Fi coffee machine. It's called Smarter Coffee (£150, firebox.com), and you can set it to grind and brew fresh coffee from the comfort of your bed, via your smartphone or tablet. Let your mates try to out-geek that.



5-MINUTE HACKS

IF NOTHING ELSE, AT LEAST...

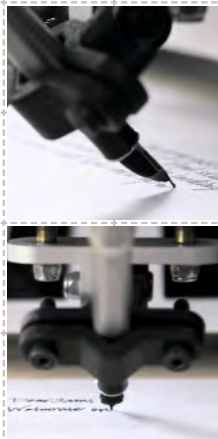
1 GET A ROBOT GHOST WRITER

Can't really be bothered to handwrite those post-wedding 'thank you' notes? This robot will do it for you – in your own handwriting:

1 Go to hellobond.com and click on 'my handwriting'. Here you can choose from various stock handwriting styles or, for US\$200, request that Bond's robot learns your exact style.

2 You'll be sent a handwriting form, which you'll need to fill in, scan and send back to Bond. The robot will learn your 'idiosyncrasies' within a week.

3 Now go to 'send notes', choose a card style and fill in your recipient's address. If your laziness is on behalf of work, you can also add company logos in the 'corporate notecards' section.



2 READ WITH YOUR EARS

Need to catch up on emails, PDFs or a riveting web article on your drive to work? Get your phone to read them to you:

1 To have the web's best features read out to you by a 'voice artist', download Umano (Efree, umano.me). Users vote for articles they'd like to hear and the winners get narrated.

2 Need to read a vital PDF for The Meeting? On a Mac, highlight the text, right-click then select 'Add to iTunes as a Spoken Track'. (You may need to enable this feature in System Preferences under 'Keyboard'.)

3 Both iOS and Android phones can read out emails. On iPhones, ask Siri to 'read my email'. To do the same on Android, download The Commandr app for Google Now (Efree, Google Play).

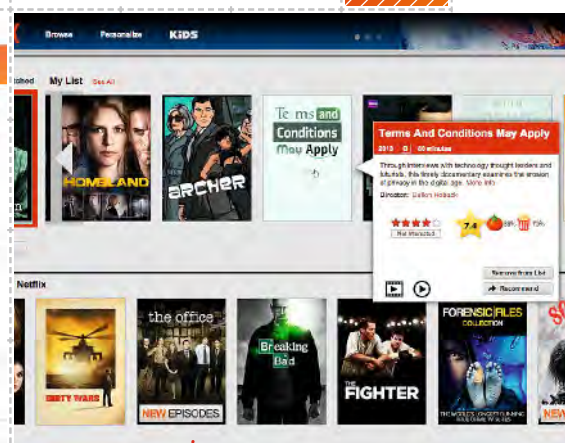
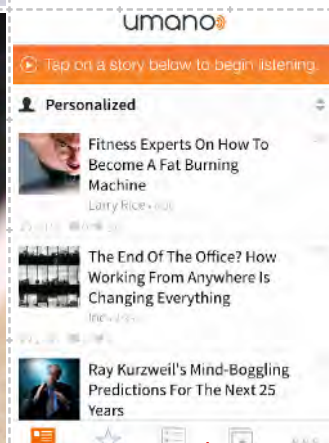
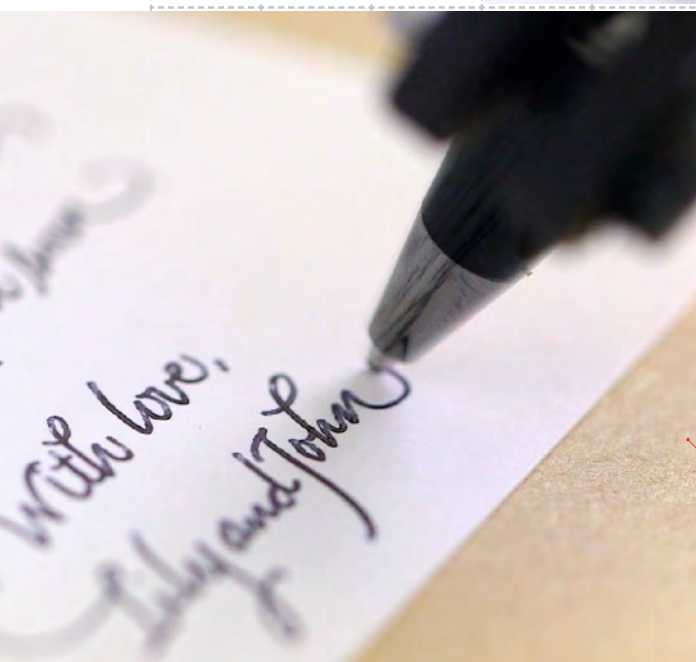
3 SUPERCHARGE YOUR NETFLIX

Yes, even *Stuff's* favourite video streaming service has room for improvement:

1 To spruce up Netflix's web interface, install the Chrome extension 'Flix Plus' (chrome.google.com). This fades out watched shows in your list, integrates reviews from sites like Rotten Tomatoes, and even hides episode spoilers.

2 Looking to rekindle an old-fashioned, communal telly-watching experience? Rabbit (Efree, rabbit.it) lets you share your stream and chat with up to nine friends.

3 To find out which films will be removed and added, bookmark New on Netflix (netflix.maft.uk) or follow @NewOnNetflixUK. Its 'Last Chance' and 'Coming Soon' lists are particularly handy.



1

2

3

TUNE IN NEXT MONTH TO...

● Discover drum machines ● Plan your summer travels ● Laugh along to the best new comedy



GET YOUR
TICKETS NOW AT
GADGETSHOWLIVE.NET

**8-12 APRIL
2015
NEC BIRMINGHAM**

SEE, TRY & BUY
THE VERY LATEST
TECH ON THE
MARKET



Powered by:

guidebook

THE UK'S LARGEST TECHNOLOGY EXHIBITION

Spanning the equivalent of almost 7 football pitches and stuffed full with exhibitors showcasing the latest technology, this is an unmissable event for any gadget lover! The show is also much more than just an exhibition - with free to attend theatres, international inventions, gaming tournaments, interactive features and of course the spectacular live Super Theatre performance featuring the Gadget Show presenters. The UK's biggest technology event is back, tickets are selling fast, so get yours today!

In partnership with:

WIRED

Stuff

WHAT HI-FI?
SOUND AND VISION

T3

i The concise
quality newspaper

**HOW IT
WORKS**



Stuff

TOP

TEN

OF EVERYTHING

Smartphones	122
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 For full reviews of every product in the top 10s, visit stuff.tv/reviews

HOT
BUY

1

**Motorola Moto X**

After the Moto X, you won't want to go back to any other Android. It's smart, fast and beautifully crafted. Motorola's software works together seamlessly to make your life that bit easier and its brilliant Moto Maker means a personalised top-spec smartphone like never before. The Motorola feels like it's built for everyone, something made even sweeter by the price. It's no budget Moto G, but it is a reasonable £460 for the 32GB model. Who could say no to that?

STUFF SAYS

The first truly gorgeous, seriously-specced Android phone that puts you in control – it's brilliant

from £390 ★★★★★

2

**LG G3**

LG surprises us again. There's barely a single thing wrong with the G3... and so, so much that's right. Upgrades range from sleeker back buttons to the bigger, better 2K screen and laser-assisted camera. And it still lasts 15 hours. How do they do it?

£215

★★★★★

3

**Apple iPhone 6**

With its slim, deeply attractive build and software overhaul, the iPhone 6 is the freshest-feeling iPhone in years. Its larger screen is big enough to be a useful improvement, with gorgeous colours, and this is Apple's best ever battery.

from £535

★★★★★

4

**Sony Xperia Z3 Compact**

This is, without a shadow of a doubt, the best sub-5in Android phone around. The power of a full-size flagship, an excellent camera and an impressive battery life are all crammed into a device that's a pleasure to use no matter the size of your digits. Impressive stuff.

£290

★★★★★

BEST FOR
DAINTY HANDS

5

**HTC One M8**

HTC's flagship phone has enough power to take it to the top of the AnTuTu benchmarks. It's a beaut to look at and to use, and it's even got a whole load of Lytro-style post-snap refocus features for photographic fun.

£400

★★★★★

BEST FOR
RAW POWER

6

**Samsung Galaxy Note 4**

Samsung was first at the phablet game, and with the Note 4 it's still the best. The ace camera, Multi Window feature and pressure-sensitive S Pen make proper use of the extra screen real estate. Plus, it has the longest battery life of any 2K phone we've tested.

£545

★★★★★

7

**Sony Xperia Z3**

The refined Xperia Z3 is the phone the Z2 should have been and every bit as good as that sounds. It's sleeker and easier to hold, but with the same stunning screen, camera and hi-res audio. Not to mention the incredible battery life. PS4 Remote Play is due soon.

£400

★★★★★

8

**OnePlus One**

Believe the hype. To get one of the best smartphones on the planet, you don't need £500 or £40 a month any more. You just need an invite. In terms of design, performance, screen and battery life you simply can't get better than this for anywhere near the price.

£270

★★★★★

BEST FOR
VALUE FOR
MONEY

9

**Samsung Galaxy S5**

Big, bold and stuffed with tech, the Galaxy S5 is a bona fide superphone that will delight Samsung fans, although it has some very stiff competition. It has a faster processor, a slightly bigger screen and a more solid (if not quite stylish) feel than the S4.

£395

★★★★★

10

**Motorola Moto G**

Google sprinkled some magical Nexus dust over this Motorola blower: the Moto G costs a mere £130 yet has a distinctly non-budget 4.5in 720p screen and quad-core processor. Paltry storage and a poor camera count against it – but then again: £130!

from £130

★★★★★

● Prices quoted are for handset only unless otherwise stated



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HOT BUY 1	 Apple iPad Air 2 The iPad Air didn't really need to be thinner, but that doesn't mean 6.1mm isn't mighty impressive. This combines with reassuring weight and impeccable build quality to make this the most desirable tab on the planet. While the display is the same Retina resolution as before, clever screen tech brings the pixels closer to the surface, and the whole experience is even faster than before thanks to the new A8X chip. Basically it's the best tablet in the world made even better.	STUFF SAYS Thinner, lighter and mightier: Apple's iron-fisted reign at the top of the tablet charts continues unabated from £400 ★★★★★
2	 Apple iPad Mini 2 With Retina Display The iPad Mini 3 is out now but all it adds is Touch ID. The good news is that the Mini 2 is now down to £280, which is frankly bargain-tastic. That's why the 'old' model stays in our Top 10 – if you're after a mini-tablet of real quality, your choice has just got easier.	from £280 ★★★★★
3	 Samsung Galaxy Tab S 10.5 Samsung has blessed the Galaxy Tab with one of the best tablet screens we've ever laid eyes on, plus an impressive camera and some incredible stamina – but there are performance niggles and Apple's tablet app selection is still far superior.	£345 ★★★★★ BEST FOR MAGAZINES AND MOVIES
4	 Tesco Hudl 2 At this price, the Hudl 2 has far more tech rammed into its 9.85mm-thick body than you'd ever expect. It has a Full HD screen, and its 273ppi display offers the sharpest of images. This is a jaw-dropping bargain, as long as you can put with the Tesco bloat.	£130 ★★★★★
5	 Microsoft Surface Pro 3 At last, Microsoft has delivered on the promise of the tablet-cum-laptop hybrid. It proves there's space in the world for a design that's more productive than an iPad or Galaxy Note, but easier to hump around than a traditional laptop.	from £640 ★★★★★ BEST FOR WORKING ANYWHERE
6	 Asus Transformer Book T100 A stonkingly affordable tabtop with raw power, a neat design and great battery life – perfect for Office on the go, thanks to Intel's new Baytrail CPU. The 1366x768 screen is a good 'un too, with crisp text, great contrast and colours that pop.	£310 ★★★★★
7	 Google Nexus 9 The design isn't as pristine, but this is a real Android contender to rival the iPads. You get the new Android 5.0 Lollipop software, bags of power and a super-sharp display. With 12 hours of video play and two front-facing speakers, it'll be a great film buddy.	£320 ★★★★★
8	 Sony Xperia Z3 Tablet Compact A slim, light and reliable couch or commute companion, with a screen that looks brilliant despite being 'only' Full HD. The waterproofing may sway people away from choosing an iPad Mini and every gamer's eyes will light up at the mention of PS4 Remote Play.	£315 ★★★★★☆
9	 Samsung Galaxy Tab S 8.4 Samsung's superb screen, design, performance and a wider selection of optimised apps mean that against many other Android tabs it's still a winner. However, the new low price for the iPad Mini 2 makes the Galaxy Tab S 8.4 look rather pricey.	£245 ★★★★★☆
10	 Nvidia Shield Tablet This really is the ultimate gaming tablet. The Shield's sheer power and gaming smarts are incredible, with a console-quality controller and the option of seamless streaming from your PC. All it needs now is more made-for-Shield games... lots more.	£240 ★★★★★☆ BEST FOR GAMING ON THE GO

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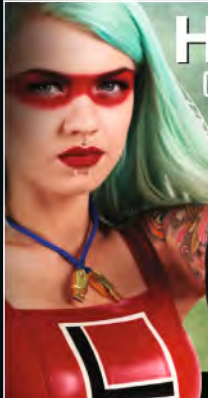


IMAGES: Howard Kearley
RIDERS (L-R): Rich De
Silva and Ben Archer



HOT BUY 1	 Sonos multiroom system Who needs to drill holes and re-plaster walls to get a multiroom music system? Not you. With the addition of the cracking little Play:1 (£170) Sonos has made it easier than ever to start spreading your tunes around. Then maybe hook up a Connect to your existing hi-fi and router, and add speakers to a Connect:Amp in another room, or a SUB for a bass boost. You'll run out of rooms before you run out of options. For a further upgrade, the Arcam rSeries SonLink DAC works a treat with the Connect.	STUFF SAYS Infinite music in every room without the need for custom installers? Sign us up now, please from £170 ★★★★★
2	 Naim Mu-so £895 for a wireless speaker?! Well yes, but what a wireless speaker it is. Naim has ploughed all of its high-end hi-fi experience into delivering a beautifully made, great-sounding device with AirPlay, Spotify Connect and aptX Bluetooth all on board.	£895 ★★★★★ BEST FOR ONE-BOX WI-FI HI-FI
3	 Monitor Audio Airstream S200 It may look a bit like a floppy skyscraper, but the Monitor Audio's Bluetooth-plus-AirPlay speaker makes a lot of sense, mostly because it takes up very little shelf/desk/table space but makes loads of lovely noise. It's a bit of a steal at £200.	£200 ★★★★★
4	 Cambridge Audio Go There are loads of very cheap Bluetooth speakers out there, but we reckon it's worth spending that little bit more to get something that's really good – and that's the Go. It sounds awesome, it's really nicely built and its battery lasts a massive 18 hours.	£120 ★★★★★ BEST FOR PICNIC PARTIES
5	 Bluesound multiroom System Fancy a bit of Sonos-style multiroom but with better-than-CD-quality sound thrown in? You want a Bluesound. There are all-in-one speakers, adapters for your existing hi-fi, and a Vault that rips and stores all your CDs. All can handle high-resolution audio.	from £400 ★★★★★
6	 Audio Pro Addon T10 Available in orange, white or black, the Addon T10 is a Bluetooth speaker that also has analogue inputs and a USB socket for charging your MP3 player. Sound-wise it's punchy and deep, with just a little too much bass. It sounds best in orange, obviously.	£260 ★★★★★
7	 Libratone Zipp A fuzzy, cylindrical, colourful AirPlay dock that will deliver detailed, punchy 360° sound anywhere at all, thanks to a built-in battery that gives it four hours of outdoor life. Direct Wi-Fi skills free you from cables, routers and everything but the boogie.	£300 ★★★★★ BEST FOR AL FRESCO PARTIES
8	 Cambridge Audio Minx Xi It might not look all that fancy, but the Minx Xi is like that micro system you had at uni, only it gobbles internet music rather than Rage Against The Machine CDs. Just add a pair of quality speakers (try Wharfedale Diamond 220s) and you've got a great hi-fi.	£400 ★★★★★
9	 Q Acoustics BT3 These ultra-versatile Bluetooth speakers have an optical input for waking up the audio of your flatscreen TV. The styling is simple and so is the sound – brilliantly so, with perfect hi-fi balance and an impressive focus to the stereo image.	£280 ★★★★★
10	 Sony NWZ-ZX1 This is a premium high-res audio player, and it's the best-sounding portable device we've ever heard: you'll notice parts of songs you never knew were there. We're not so keen on the high price and lack of expandable storage, though.	£600 ★★★★★☆

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SONY

S90 SERIES • CURVED 4K UHD TV

The new S90 is Sony's first ever range of curved TVs. Available in two screen sizes: 65in and 75in, the S90 series boasts 4K Ultra HD resolution. Features and specifications include Sony's 4K X-Reality PRO picture engine, Triluminos colour technology, Motionflow XR800Hz, edge-lit LED backlighting, active 3D and a detachable Skype camera. Sound is provided by Sony's new 4.2-channel multi-angle live speaker system which allows for "expansive, uncompromised 360-degree surround sound". Other features include Sony's Social Viewing for watching with friends over Skype, Live Football Mode, One-touch mirroring and Photo share.

Prices from £3499

NAD M12 / M22

DIGITAL PREAMPLIFIER / DAC / POWER AMPLIFIER

The M12 is an ultra-high resolution digital audio hub that boasts a full roster of audiophile-grade features. An optional DD BluOS MDC Module allows streaming of a variety of music services, HD streaming from a NAS device plus it gives you full control of your music library. The M22 employs the latest generation of digital PowerDrive™ and offers a minimum of 250W per channel with amazing reserves of dynamic power at lower impedances.

£5998



BluOS



NEW



WHAT HI-FI? AWARDS 2014

PRODUCT OF THE YEAR
 Wireless speakers
 Best wireless speaker £750+
 Naim Mu-so

NAIM MU-SO

WIRELESS MUSIC SYSTEM

Through its advanced connectivity, mu-so will unleash your digital music, wherever it's stored. And it's so easy to set up and use that you'll find yourself listening to and enjoying your favourite artists more than ever before.

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£895

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BLUESOUND IS A 24-BIT NATIVE, PURE DIGITAL WIRELESS STREAMING MUSIC SYSTEM

Even 16-bit CDs have only about half of the audio spectrum that the master recording holds and that's a whole lot more than MP3s have left in them. With more than a decade of compressed audio piping through earbud headphones and cheap dock players, the time has come. The portable players we all love have created a new way of listening to music, but there hasn't really been much there to hear. Until now. Enter true 24-bit HD digital audio.

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WHAT HI-FI? AWARDS 2014

PRODUCT OF THE YEAR
 Multi-room systems
 Best multi-room system £500+
 Bluesound

HOT
BUY

1

**AKG K451**

They've actually been around a little while now, but what put the K451 on-ears back on to our radar was an official price drop from £130 to £80, and a real-world price of just £50 or less. For that money they're unbeatable – awesomely agile and punchy sound wrapped up in a subtly stylish and foldable design. Add both standard and three-button control cables for maximising compatibility and there's practically no excuse for not getting brilliant sound from your phone.

STUFF SAYS

Fantastic sound and great portability at an almost unbeatable price: the perfect PMP upgrade

£50 ★★★★★

2

**Philips Fidelio M1 MkII**

Your commute deserves a quality soundtrack, and second-generation Fidelio M1 headphones give you precisely that. There's oodles of detail to the sound and they punch harder than the Hulk. Beats and their ilk can't touch them.

£145

★★★★★

3

**SoundMagic E10S**

This is actually the third version of SoundMagic's awesome, affordable in-ears – not that you'd tell by looking. They sound even better, though: a little smoother and more refined, with tight, weighty bass. Plus there's now a mic and button for smartphone use.

£40

★★★★★

4

**Sony MDR-EX650AP**

If you're prepared to pay a little extra for your in-ears, these Sonys are even better than the SoundMagics above. The sound is that bit bigger, a little more detailed and a little more grown-up, and if you don't like the brass finish there's a silver version.

£60

★★★★★

5

**Bose QuietComfort 25**

The best kind of silence is the kind you then fill with sweet, sweet music, and that's what the QuietComfort 25s give you. The active noise-cancelling quells office hubbub, air-conditioning and aeroplane hum, and delivers cracking sound in its place.

£270

★★★★★

**BEST FOR
SHUTTING OUT
THE WORLD**

NEW

6

**Philips Fidelio M2BT**

Building on the award-winning M1BT, Philips has added NFC for its new wireless Bluetooth headphones and swapped the dark blue design for an understated black finish. The smart built-in controls and rich sound performance remain.

£195

★★★★★

**BEST FOR
GREAT SOUND
WITH NO WIRES**

7

**AKG Y50**

The bright colour options (they're available in yellow, teal and red, as well as black) and massive logo have a slight try-hard feel about them, but the Y50s make up for it by sounding loads better than the more 'street' on-ear headphones out there.

£70

★★★★★

8

**Sol Republic Master Tracks**

Really tough things are usually really ugly, which is why the lovely styling of the "virtually indestructible" Master Tracks headphones is so refreshing. Loud, punchy, fast and controlled, the sound is just as attractive as the design. Worth every penny.

£115

★★★★★

9

**Sennheiser Momentum**

Classily styled, cushion-comfortable and smooth-sounding, the Momentums are the perfect over-ears for the dapper man about town. There's also an on-ear version, smaller and cheaper at £110, available in pink, blue, green, brown and, um, 'ivory'.

£180

★★★★★

10

**PSB M4U2**

Yes, the M4U2s have got great noise-cancelling, but that's only half the story. Using the built-in amp produces a sound that's almost unbelievably punchy, clean and exciting. They might be a bit heavy, but that audio quality really is worth the weight.

£250

★★★★★

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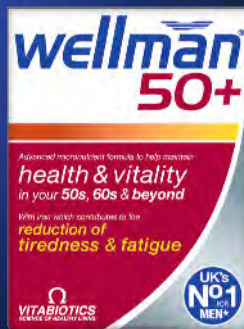
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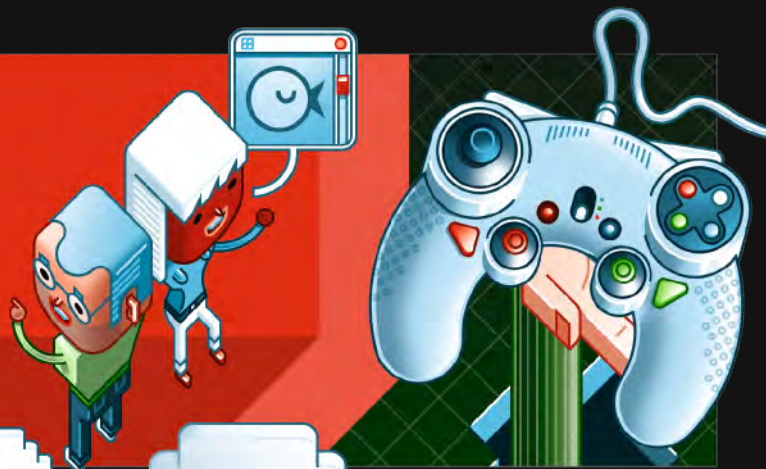
HOT BUY 1 	Sky+HD The new Sky boxes come with built-in Wi-Fi, to make it easier to access on-demand programming, of which there's now more than ever, including pre-release blockbuster films. There's now a 2TB drive available that, with more than 65 channels of HD, might well be worth the outlay. On the move, the Sky Go app is supremely slick. But the most important thing is this: Sky has more movie, TV and sport content – and more of it is unique – than any other service.	STUFF SAYS The only choice for serious TV, movie or sport addicts from £free + £21.50/month ★★★★★
2 	Sony BDV-N5200 A whole (home) cinema (minus a telly) in one box? That's the Sony BDV-N5200. A Netflix-toting Blu-ray player, an amplifier, five speakers and a subwoofer, all for a lot less than an iPhone 6. There's even a wireless adapter for the rear speakers.	£400 ★★★★★
3 	Sonos Playbar A characteristically Sonos take on the soundbar, the Playbar hooks up to your TV via its single optical input and fills your room with a big, detailed sound. And as with all Sonos kit, it can stream your own music files, Spotify and more as part of a multiroom system.	£600 ★★★★★ BEST FOR STREAMING MUSIC
4 	Sony BDP-S7200 Sure, you can pick up a Blu-ray player for just £50 these days, but if you're serious about your movies then you want to make sure they look and sound crisper than a Kettle Chip. That's where the S7200 comes in. It even throws Netflix and iPlayer into the bargain.	£180 ★★★★★
5 	Yamaha YSP-2500 If your only requirement for a soundbar is that it should sound better than your telly, almost any will do; but if you want one that will fool your ears into thinking they're surrounded by actual speakers, you want the amazingly clever Yamaha YSP-2500.	£650 ★★★★★
6 	Virgin TiVo Hardware-wise, the taste-learning TiVo is a Sky+HD-beater, but it loses out on content. Mind you, subscribers to the 'XL' package now have free access to all the BT Sport channels: Premier League football, MotoGP and more, in lovely HD.	from £free + £24/month ★★★★★
7 	BenQ W1400 What's better than <i>Inception</i> ? <i>Inception</i> on a 300in screen, that's what. How do you get a 300in screen in your house? You buy the BenQ W1400. If your lounge isn't quite that big it can also project an 84in image from just 2m away. Try finding an 84in TV for £1100.	£1100 ★★★★★
8 	Panasonic DMP-BDT700 The BDT700 is the Blu-ray player for the most serious of serious home cinema buffs. It's all high-end materials, sound-enhancing dampening and 4K-upscaling video circuits. But yeah, it'll also stream <i>Vampire Diaries</i> from Netflix if that's more your kind of thing.	£400 ★★★★★
9 	Humax DTR-T1010 YouView Delivering free-to-air TV with the convenience of Sky or TiVo, the Humax lets you browse the last week's catch-up TV direct from the EPG or record your own on its HDD. The iOS/Android app's remote record is handy, and it's all without a costly subscription.	from £220 (500GB) ★★★★★
10 	Sony BDP-S5200 There's no display, it looks a bit cheap and its remote is a bit naff, but this dinky Blu-ray player offers a lot of bang for very few bucks. For the money you get a very good picture, 3D (if you're still into that), Wi-Fi and plenty of on-demand apps. Bargain.	£80 ★★★★★

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HOT BUY 1	 LG 55EC930V Self-illuminating OLED (organic light-emitting diode) screens used to be full of potential but were criminally expensive. No longer. Behold this curved LG marvel which, for the most part, is no thicker than a pane of glass and verging on affordable. The levels of contrast and dynamism are a revelation. No, it's not 4K. But when 1080p Full HD looks this good, you won't be counting pixels – and it'll be some time before you'll be able to feed your TV a 4K-heavy diet anyway.	STUFF SAYS 4K and millions of pixels might be the future, but this LG OLED is the best TV you can buy for viewing now £2290 ★★★★★
2	 Samsung UE55HU7500 Finally, a 4K TV that can be recommended without hesitation, plus it's just as good as a full HD TV when playing 1080p stuff. Chuck in all of Samsung's usual smart TV whizzbang, remove the silly motion-sensing controls and you've got a real star.	from £1800 ★★★★★
3	 Sony KDL-50W829B 4K a bit too new-fangled (or pricey) for you? How about a 50in edge-lit LED LCD with all of Sony's smart features for well under a grand? It's not even like picture quality's been sacrificed – this is an absolute corker of a telly in every way.	£670 ★★★★★ BEST FOR AFFORDABLE BRILLIANCE
4	 Samsung UE46F7000 The 46in F7000 might just be the sweetest spot in Samsung's current range – the same spectacular performance as the F8000 series but without the show-off design. Great picture quality and slick online functionality in one box.	£1380 ★★★★★
5	 Sony KD-65S9005B One of the best curved TVs we've tested is actually the least curved TV we've tested (not counting the actual flat ones, of course). How much difference the curve makes is hard to tell, but what we can say is this is an awesome-performing 65in 4K TV.	£3900 ★★★★★
6	 Sony KDL-32W706B There's nothing wrong with sticking with a smaller TV, but you should still make sure you pick a good 'un. This 32in Sony is the best, in terms of both picture performance and features, which include 1080p resolution and all the smart stuff you can handle.	£330 ★★★★★ BEST FOR A SMALLER SCREEN
7	 Sony KD-55X8505B If you want to jump on the 4K bandwagon with Sony you could go for the wedge-shaped X9, which is great, but we'd suggest that this slimmer, less intrusive 'entry-level' 55-incher is an even better buy. It's still got all the smart stuff and great performance.	£1300 ★★★★★
8	 LG 42LB700V The performance is very good, but what makes this 42in LG really special is its webOS user interface, which treats all sources, apps, recordings and live broadcasts equally, getting you to the content you want to watch quicker. And isn't that what a TV is for?	£500 ★★★★☆
9	 Panasonic TX-42AS500B It's not the prettiest, it's not the smartest, and with just two HDMI inputs it's not the most connected TV about, but there's a really simple, intuitive OS pulling the strings here – and a performance that's very strong given the price and 42in size.	£390 ★★★★☆
10	 LG 55UB950V LG's 4K flagship looks gorgeous with Netflix's 4K content... but as with the other LG telly at no.8, the real story here is the webOS interface. This 55in set is by far the most pleasant, colourful, multi-task-friendly and downright fun TV there's ever been.	£1600 ★★★★☆ BEST FOR MAKING TV FUN AGAIN

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HOT
BUY

1



Apple MacBook Air 13in

The 2014 MacBook Air update means, once again, our favourite old laptop is now our favourite new laptop. Nothing's changed on the outside, and under the skin there's just a slight processor boost from 1.3GHz to 1.4GHz, but combined with a price cut of £100 on each model we're still happy with that. The very top model, which comes with a 256GB SSD, is now just under a grand, too. Head to stuff.tv for our full reviews of both 13in and 11in versions.

STUFF SAYS

It's not a major upgrade, but Apple has improved the Air's already awesome spec and lopped £100 off the price

from £850 ★★★★★

2



Apple MacBook Pro with Retina Display 13in

Choosing between Air and Pro is getting harder. Both now run on Haswell chips, but the Pro is faster, with a 2014 processor boost. There's a 4K-capable Thunderbolt 2 port, and then that Retina screen, one of the most gorgeous you'll see. Tough call.

from
£1000

★★★★★

**BEST FOR
EVERYTHING
BAR THE PRICE**

3



Microsoft Surface Pro 3

The fact that it's the only device to feature in two of our Top Tens is a testament to the Surface Pro's versatility: it's a strong tablet, but its full-fat operating system and powerful innards mean it's also a worthy adversary to Ultrabooks and MacBooks.

from £750
(with Type Cover)

★★★★★

**BEST FOR
WORKING
ANYWHERE**

4



Dell Chromebook 11

Well-built, tough and powerful: Dell has delivered pretty much all you could want from a wallet-friendly Chromebook. Its high-quality finish, solid keyboard and responsive trackpad feel premium and it's a runaway success in our benchmarks.

£240

★★★★★

**BEST FOR
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5



Alienware 17

A brute of a machine in every way, the Alienware 17 weighs as much as four MacBook Airs and probably frags harder than 10 of them. Core i7 Haswell processor at 3.4GHz, Nvidia GeForce graphics, up to 32GB of RAM... our trigger finger's already itching.

from
£1500

★★★★★

6



Lenovo Yoga Pro 3

The third entry in the Yoga Pro line refines the laptop/tablet hybrid design with a power-sipping new Intel Core M processor plus slimness and style to make even the MacBook Air look worried. And you can stand it up like a tent. If you want.

£1300

★★★★☆

7



Asus C200

The holy grail of laptop battery life is 10 hours, and Asus's C200 Chromebook misses it by 17 minutes. That's as good as we've seen from a MacBook Air costing four times as much. There are more powerful Chromebooks, but this one just keeps on going.

£200

★★★★☆

8



Acer Aspire S7

The Aspire S7 is almost the perfect Ultrabook – it matches the MacBook Air for weight, beats it for slimness by 6mm, and has a gorgeous 1920x1080 touch-friendly screen. Only its battery, which lasted a mere 5hrs on test, prevents it getting that fifth star.

£1000

★★★★☆

9



Toshiba CB30-102

Although this Chromebook only includes 2GB of memory, it wowed us with its incredible performance. It's able to juggle the web's most demanding sites without any lag or stuttering and its appealing larger screen makes it well suited for media.

£200

★★★★☆

10



Acer Aspire Switch 10

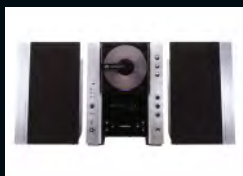
A Windows laptop and 10.1in tablet for just £280? This seriously flexible bundle is Asus's best hybrid yet. Only a bit heavier than a MacBook Air, the square-edged ergonomics and battery life are issues, but as a whole package it makes a lot of sense.

£280

★★★★☆

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Onkyo HS-N1 £600

Stuff said It's more of a 'style' system than most micro hi-fi's, and capable thanks to a good mix of looks, features and performance; but it's not cheap and you don't get a great deal extra for your money. The biggest downside is the bass, or rather the lack of it.

★★★★☆



Sony KV14LM1 £190

Stuff said Finished in a metallic grey/blue with swish ergonomics, this mini Sony will sit pretty in any surroundings. It also offers rather practical one-button tuning, and comes equipped with RGB Scart. The style and convenience justify the price tag.

★★★★☆



Hyundai Coupe 2.7 V6 £18,500

Stuff said While the new Hyundai Coupe has its faults, it still delivers fine value – the combination of style, performance and gadgetry is stunning when you consider the price... and the driving rewards are enough to keep you interested.

★★★★☆



Nokia 6310 £150

Stuff said This isn't the smallest handset but at least it's thin, and compatible with a wide range of accessories. It's also sturdy and features Nokia's beautifully simple menu system. But the killer feature is Bluetooth, which allows wireless networking.

★★★★☆

HOME COMPUTERS

HOT BUY	1		Apple iMac Other than regular power upgrades and a bit of slimming, the iMac has been largely unchanged for a while, but it does now run Apple's lovely Yosemite OS. There's also now a more affordable version and an eye-wateringly expensive 5K model.	from £1000 ★★★★★	BEST FOR ALL-ROUND BRILLIANCE
	2		Sapphire Edge VS8 This mini-PC may look like the Terminator's lunchbox, but it houses AMD's 1.6GHz A8 APU and dedicated HD7600G graphics with 4GB of RAM. A capable little fellow, the VS8 even does a decent job with the latest gaming titles (with the detail dialled back a little).	from £370 ★★★★★	BEST FOR COMPACT POWER
	3		Alienware X51 (2014) The X51 hasn't changed a huge amount, but the wee size matched with powerful components make it perfectly suited to HD gaming. Steam Machines are going to liven this market up but right now it's the best balance of power and form in PC land.	from £800 ★★★★★	
	4		Raspberry Pi Model B+ It's a fully functioning PC that's barely bigger than a credit card, and now it's a little more flexible thanks to two extra USB ports and better power management. Don't expect a 'proper' computer – this is for tinkerers. Look out for the Raspberry Pi 2 Model B soon.	from £23 ★★★★☆	
	5		Zotac ZBOX Sphere OI520 About the size and shape of a cannonball or cantaloupe, this striking sphere will certainly draw attention. For media playback it's perfect, but high-end gaming is a no-go due to low frame rates. However, even in full swing it barely raises a decibel.	£310 ★★★★☆	

GAMES CONSOLES

HOT BUY	1		Sony PlayStation 4 It may not quite be the finished article, but this is the best games machine on the planet. It has whisper-quiet operation, a sleek form and bags of power, with full 1080p on all titles and not a whiff of lag. When proper media streaming arrives, it'll be unstoppable.	from £320 ★★★★★	
	2		Microsoft Xbox One This is very different to the Xbox One of 2013. Most significantly, the unpopular Kinect feature is now out of the deal, allowing Microsoft to drop the price and releasing enough extra power for developers to make their games look and play better.	£330 ★★★★★	
	3		Alienware Alpha It's not quite a PS4 or Xbox One-beater, but this is the most console-like PC there's ever been. Steam is the main interface, but it runs on top of Windows for maximum game compatibility, and performance is very impressive.	£450 ★★★★☆	
NEW	4		Sony PS Vita Slim If you're serious about gaming on the go, the Vita is way better than a smartphone, and when you get home you can play your PS4 games in bed thanks to Remote Play. That's gaming decadence, right there.	£145 ★★★★☆	
	5		Nintendo Wii U While it hasn't had the same impact of the original Wii, don't underestimate the U's fun factor. Nintendo's bottomless bag of superb game franchises rolls on with the excitement of Mario Kart 8, with its anti-gravity karts and submarine racing.	£150 ★★★★☆	

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HOT BUY 1		Pebble Steel Unveiled at CES 2014, the Steel keeps the straightforward looks, crisp display and five-day battery life that helped the standard Pebble win our hearts. But it holds more RAM, apps and customisable faces this time, and swaps the plastic for either a 'Steel' silver or matte black stylish suit, making it look and feel more like an actual watch. The Steel goes beyond the gimmicks and into the world of real-world wearable tech. Pop it on your wristwear wish-list.	STUFF SAYS The best smartwatch money can buy... and the original plastic Pebble is still available for £80 less from £180 ★★★★★
2		Fitbit Flex The Flex delivers all of Fitbit's activity-tracking smarts but in a form factor that's less fiddly than its belt-clip counterparts. It's packed with Bluetooth, NFC, vibratamotor and an LED display. See also the Fitbit Charge, with numeric display, for a few quid more.	from £70 ★★★★★ BEST FOR TRACKING YOUR LIFE
3		Jawbone UP24 Now with Bluetooth for hassle-free syncing, the stylish UP24 is worth the extra £30 over the Jawbone Up. The app introduces new challenges and tracks your sleep patterns. It will also gently nudge you, if you're lazing around, to get back on the move.	£100 ★★★★★
4		Motorola Moto 360 With its iconic, head-turning design, this could be the first wearable you will want to wear. The Moto 360's our favourite and most comfortable Android Wear watch so far, but its battery life might make you anxious and it's a few specs short of brilliance.	£190 ★★★★★
5		Philips Hue Pair these smart LED bulbs with 'recipes' on ifttt.com – set them to change colour with the weather or when it's time to run to the train. They also tie in with Philips' own Ambilight TVs, casting the colours from the screen across your entire room..	from £50 ★★★★★☆
6		Roku Streaming Stick 'Streaming Stick' tells you all you need to know, really: this is a stick, and it streams. It streams plenty, too – Netflix, iPlayer, Spotify, Sky Now and Sky Go to name a few. And unlike Chromecast, it's also a dab hand with your own video and music files. Lovely stuff.	£40 ★★★★★☆
7		LG G Watch R This circular smartwatch won't win any beauty contests, but that's about its only flaw. The G Watch R's plastic OLED screen has deep blacks, sharp text and good visibility. Its battery easily lasts a day and a half, and using it is a smooth experience.	£200 ★★★★★☆
8		Google Chromecast This USB memory-stick-sized cord-cutter is compatible with Netflix, YouTube, Google Play movies and BBC iPlayer: a cheap, simple way of getting web-sourced movies and shows onto your living-room TV.	£30 ★★★★★☆
9		Garmin Forerunner 920XT This fitness-tracking watch has so much included, it's bewildering. The star feature is the dedicated triathlon mode, which allows you to hit enter to move between sports, counting each bit (including transitions) separately.	£330 ★★★★★☆
10		TomTom Multi-Sport Cardio The new version of the TomTom Multi-Sport adds an impressively accurate heart-rate sensor to an already strong formula, allowing for more focused and personal training. It'll track runs, cycles and swims, and the companion app is also much improved.	£230 ★★★★★☆ BEST FOR TRIATHLETES IN TRAINING

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SLRs

HOT BUY	1		Olympus OM-D E-M1 The Olympus flagship is armed with the same excellent 16.3MP sensor as its predecessor the E-M5, but has an improved autofocus system, a startlingly good electronic viewfinder and masses of direct controls. Also look out for the E-M10.	£800 (body only) ★★★★★	
	2		Canon EOS 700D Look, it's a new Canon at No2. No, wait, it's the old one. Actually, it's kind of both. The 700D is a minor upgrade over the 650D, keeping its 18MP sensor, flip-out touchscreen and autofocus during video and adding little beyond a new kit lens. Still great, though.	£330 (body only) ★★★★★	BEST FOR ALL-ROUND VALUE
	3		Sony A6000 Sony's new system camera may be tiny but it packs a big photographic punch. There may be no optical image stabilisation but the incredible speed and accuracy of the A6000's autofocus is a real highlight, as is its large, clear electronic viewfinder.	£410 (body only) ★★★★★	
	4		Nikon D750 It's big and bulky, but otherwise this is one of the most comfortable and intuitive DSLRs money can buy. And with a handy tilt screen and some wireless connectivity features, there's none of the purist snootiness that we saw in the D810.	£1320 (body only) ★★★★★	
	5		Sony A7R We love this camera. It's light weight but tough and delivers results that outstrip pretty much any other compact system camera on the market. It has a huge full-frame 36.4MP sensor and noise-suppression. Your wallet might weep, but your photo album will sing.	£1300 (body only) ★★★★★	

COMPACT CAMERAS

HOT BUY	1		Sony DSC-HX60 2014's HX60 isn't a huge departure from its predecessor in terms of its build quality, ease of use, specifications and 30x zoom lens — all of which are excellent. What it does add is NFC and a newer Bionz X processor, making it a slightly nippier performer.	£230 ★★★★★	
	2		Sony DSC-RX100 III If you're looking for the best tiny snapper around, this is it. Excellent image quality, fast autofocus, a useful electronic viewfinder and professional video recording, all squeezed into a truly teeny package that'll fit into your jeans pocket. We're smitten.	£520 ★★★★★	
	3		Fujifilm FinePix X100S Fujifilm's souped up its fixed-lens retro shooter, with faster focusing and a big APS-C sensor. It's not all new, though, keeping the 35mm-equivalent f/2 lens and hybrid viewfinder from the X100. A less retro version with black finish is now available too.	£640 ★★★★★	
	4		Canon PowerShot G16 The G16 packs a lot into its sturdy body: optical viewfinder, loads of manual controls and an f1.8-2.8, 28-140mm (equivalent) zoom lens. Upgrades over the G15 include Wi-Fi and faster burst shooting of up to 12fps, while image quality is as good as ever.	£280 ★★★★★	
	5		Nikon Coolpix AW120 The ultimate rugged camera: almost indestructible, and fit for temperatures as low as -10°C, it will even survive a rinse cycle in your dishwasher. The AW120 also takes lovely pictures and impressive video in both good lighting and dimmer conditions.	£205 ★★★★★	BEST FOR EXTREME EXPLOITS



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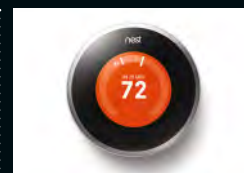
Honeywell EvoHome
£250 plus £70/radiator plus installation / honeywelluk.com
Set schedules to control the temperature of each individual room of your home, using either the tablet-like central controller or the free Total Connect Comfort app. It's a big old investment, but you'll soon pity anyone living without it.
★★★★★



Netatmo
€180 / netatmo.com
It's not the easiest product to install, but once you're up and away this is a joy to use. Its real talent is the way it uses data such as how long it takes your house to heat up and what the weather is like outside to fire up the boiler before or after the set time as necessary.
★★★★★



Hive
£200 or £150 for British Gas customers / britishgas.co.uk
Installation is simple, plunging your boiler into the connected age. Hive's a winner for houses with old-fashioned non-combi boilers: with separate controls for the hot water, you can get it stoked up before everyone has their morning shower.
★★★★★



Nest Learning Thermostat
£250 / nest.com
Nest has the smartest design, paired with a ton of features. We recommend making use of its IFTTT channel: it offers map-based geo-fencing, or you can fire up the boiler with a text. There's even voice control via Google Now.
★★★★★

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www.elliottbrownwatches.com

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Finally built that wormhole, then? Almost. My DIY store's just run out of one crucial ingredient: exotic matter. Once that's back in stock, I'll be all set for *Through The Keyhole*. "What type of person keeps a wormhole in their shed?", Loyd will say. "David, it's over to you." Of course, David (reincarnated as a hologram) will point out that traversable wormholes are probably impossible. But we can still cheat. For example, NASA's just made an incredible application for Microsoft's HoloLens called OnSight. Instead of teleporting humans to Mars, it brings Mars to geologists...

Wow, geologists must have big offices. Well, that's the clever thing about OnSight – scientists don't need a big room, or even to be in the same room, to do a team study of Mars's surface. OnSight crunches together data and images from the Mars Curiosity Rover, builds a 3D simulation of the terrain, and uses HoloLens AR glasses to overlay it onto the wearer's point of view. They'll be able to stroll around the rocky surface, read the story of the landscape, and see their colleagues appear as avatars. Gesture controls will let them pick the best spot. Manned space missions suddenly seem quite quaint.

Sounds like great news, if you're a leading planetary geologist.

To be fair, they do have to stare at rocks all day. Besides, the best thing about OnSight is its potential for non-Martian applications. Fancy turning your bedroom into the Tate Modern? Playing *Minecraft* on your coffee table? Hanging out with dinosaurs in an AR *Jurassic Park*? These could all potentially follow NASA's OnSight tests in late 2015. There's no reason Mars tours couldn't one day be opened up to Joe Public either. In other words, the departure lounge for space tourism could soon be, er, your lounge.

[Words Mark Wilson]

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